ACPA Standard Skill Descriptions ICT Domain

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Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
IT Basics				
	Internet			
		Internet Basics	Internet	Understands outlines, such as Internet services (a DNS, a WWW, an E-mail, a FTP, other structure of service), and connections with the Internet (dialup connection, a dedicated line IP connection, etc.) and development of Internet (intranet, a firewall, electronic commerce, etc.).
			Internet Component Technology	Understands outlines of the Internet/intranet, TCP/IP protocol, structure of service on the Internet, creation technology of Web contents, ISP/ASP, and security technology.
			Information Use by Internet	Can retrieve the effective information by Web, and operation of the related tools that are useful to work.
		E-mail	Setup of Mail Software	Can set up the connection with a mail client software (Outlook Express, Outlook, Becky!, etc.) and set up in a selective way.
			Mail Fundamentals	Understands the importance and meaning of the protocols, SMTP, POP (POP3, APOP, POP over SSL), IMAP4, OutboundPort25, blocking and SMTPath submission port(port587) etc. that are usedby an E-mail service. Understands the meaning of the structure of E-mail transmission and reception, and the header fields (From, To, Cc and Bcc, Subject, the text, attached file), and can use these correctly.
			Mail	countermeasures in the E-mail, the writing of the business mail, reception and arrangement of an E-mail, and a convenient function and notes about mail, etc.
		Information Ethics	Ethics and Rule	Understands the ethics and manners on the network use. Understands the illegal act on the network use. Understands the outline of RFC (Request for Comments).
			Technical Judgement/Regulation	Understands the technical aspects and the importance of a standard in information ethics.
			Ability to Not to Become Victim	Understands the crisis management of information through case studies etc. including the possible current events.
			Ability to Not Become an Assailant	Understands and practices the respect of privacy, honor, and intellectual property rights, understands the importance of crisis management of information, the matter which it should be careful of in the information society through case studies etc.
		WWW World Wide Web	WWW Fundamentals	Understands the outline of WWW. Understands the composition of WWW server and the mechanism of WWW.
			HTML Tagging	Understands the HTML and upload.
			Style Sheet, Home Page Tool	Understands practical use of style sheet, and use of a homepage tool.
			Web Site Construction, Prototype Creation	Understands website construction and prototype creation.
		Security Measures	Fundamental knowledge of Security	Can classify offensive types (unauthorized entry, virus, worm, malware, spot, etc.), and understands through a case study etc. what type of damage it suffers, respectively.
			Prevention from Attack	Can classify malware etc. and understands through a case study etc. what kinds of damages it suffers, respectively.
			Leak-of-information Preventive of File	Understands the encryption for preventing an information leak from the hard disk and removable media of a personal computer.
			Measure When Damage is Suffered	Understands and practices how it should be coped with, when damage such as a virus is suffered.
	Business Tool			
		Document Creation	Foundation of Document Creation	Can create business documents using word-processing software, and can use tabulation/edit function, and graphics function (figure). Can make font-related changes (style/size /ornament). Understands and adjusts the basic format of a business document.
			IM(Input Method)	Can input the starting method of IM and a Chinese character. Can input the Chinese character that does not understands reading. Can input a Chinese character from a character code. Can input the special character used in German, French, etc.
			Chart/Table/Graph	Can make a tabulation, a drawing, a graph, the cooperation functions (OLE etc.) with other software, and can use a clip art. Can make the mixture of a figure and a character, adjustment of arrangement, and a grouping.
			Text Editing	Can make a setup of a multicolumn/release . Can make the positioning of characters, such as the left, inside, flush right, and a paragraph. Can use a plug header and a footer. Can set up a form and select a paper. Can make a page setup and print it.
			Text Proofreading	Can make the text proofreading using the text proofreading tool of word-processing software attachment. Can make the spell checking using the spell checking tool of word-processing software attachment. Can make the text proofreading by two or more persons using a comment function, a change history record function, etc. and its reflection.
		Spreadsheets	Basic Functions Related to Spreadsheets	Can create the table using spreadsheet software and can use a calculation function (various functions). Can create the table using a formula.
			Cell Operation	Can make the relative specification of a cell. Understands absolute specivation and can understands the operation at the time of a copy and a movement.
			Table Editing	Can make a form operation of a ruled line. Can use an operation of conditions.
			Advanced Use of Functions	Can perform advanced use (such as nesting) of a function.
			Graph Creation	Can create a graph and make a drawing.
			Printing of Book and Worksheet	Can make a page setting and a printing.
			Use of Database Function	Can make use of the data over a sheet. Can make use a data as a database.
		Presentation Document Creation	Slide Creation	Can create the fundamental slide using presentation software.
			Operation of Text and Table	Can edit a text and a paragraph. Can create a table and can use it. Can use object of other software.
			Use of Graphics	Can create a figure and can insert it. Can represent an expression by animation. Can make an operation of a figure.
			Special Effects	Can make practical use of a sound and an animation.

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			Performing Presentation	Can set up and execute a slide show Can operate a handout. Can selkect the design of a slide and change the layout. (Knows the presentation using multi-display environment after Powerpoint 2003.)
		Database Basics	Database Fundamentals	Understands the foundations of search and extraction of the data using database software. Understands the view of a relationship.
			Database Creation	Can design and create a table. Can make the model of the field and a setup of a key. Can make input of data, search, extraction, and rearrangement. Can create a form.
			Design and Creation of Query	Can make a design and creation of a query.
			Presentation of Report and Form	Can make the design and creation of a report. Can print a report. Can make the design and creation of form.
	Computer Basics			
		Hardware Fundamentals	Constituent Components and Functions of Hardware	Understands the foundations of constituent components of s (CPU, memory, external storage device, etc.) computer. Understands the outline of data expression. Understands the principle of the operation of a computer.
		OS Basics	Function and Internal Structure of OS	Understands the structure of the role of OS, and internal structure (input-and-output control, file management, process management, memory control, process management, memory control, etc.).
			Basic Operation of PC	Can make installation of configuration, such as installation/update of application, and network connection, and a printer about a client personal computer. Understands the compression and defrosting that can make use and offer of a shared file, and its type, and can make compression and defrosting according to a type.
		Peripheral Equipment	Printing Device	Understands the function, the type, and the various features of a printer,
			Auxiliary Storage Unit	Understands the type and the features about the hard disk and the external storage.
			Network Equipment	Understands the features about network composition devices, such as modem, router, and HUB. Understands the connection and setup of above devices. (Note) In the skill component of Network>Network Technology>NW Component, the function of various networks is described.
		Basic Programming	Algorithm	Understands the concept about algorithm. Understands the composition element and each meaning of ;flow chart. Understands the typical algorithm (search, alignment, character string, and file processing).
	Elementary Computer Science			Theoretical Basis of Information and Computation
		Basic Theory of Information	Number Conversion and Data Representation	Understands the radix conversion, the numbering format (includes complement representation and decimal fraction representation), the non-number format (representation of character, audio and image), the operation and the precision.
			Information and Logic	Understands the logic operations, the coding theory, the predicate logic, the state transition, BNF(Backus-Naur Form), the Polish notation, and the set.
		Applied Mathematics	Numerical Calcuration	Understands the matrix and the determinant.
			Probability and Statistics	Understands the numerical sequence, the combination, the probability, the addition and the multiplication theorem, probability distributions, the expected value, the Markov process, the inference, the testing, and the regression analysis.
			Optimization Problem	Understands the linear programming, PERT, the maximum short circuit problem, and the queueing theory.
		Data Structure and Algorithm	Data Structure	Understands the array, the list, the stack, the tree, and the hush, etc.
			Algorithm	Understands the sort, the search, the reflection, the graph, the string manipulation, the flowchart, the computational complexity and, etc.

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Personal Skill				
	Communication			
		Documentation	Business Document	understands the foundations that create an exact expression and an exact text. Can practice how to use the fundamental composition of a business letter and the right conventional phrase and how to use the right honorific expression. Understands the exact usage of a rule of the fundamental way of assembling of a text and the character notation, and language, and how to use an
			Electronic Mail	Understands and can practice about the fundamental way of writing of an E-mail.
			Text Representation	Understands the suitable usage of grammar rules and syntax of a language, and how to use an idiom Understands the abovementioned mode of expression, and create intelligible documents.
			Graphic Representation	Undesratand and can practice an effective illustration and the point of graph creation.
		Presentation	Presentation Sheet Creation	Understands the effective composition method and the effective color coordination of the presentation sheet. Understands the point of intelligible explanation. Understands the basic composition of data creation and can create the documents by which the introduction development turn and conclusion are ready.
			Presentation Performance	Can build the environment according to the purpose, such as the position of a projector, the height of a chair, arrangement, etc. Understands the preparation and advance method of a presentation.
			Persuasive Presentation	Understands the step of hearer basis. Can consider a part for introduction and subject conversion and can compose a talk in the way that assumes to suppose the conclusion. Understands the composition of the persuasive talk. Understands the foundations of how to prepare a good talk.
			Critical Thinkig	Can analyze the psychological factor of the fault in fact recognition. Understands the factor of the deviation of an information gathering. Understands the factor that misguides a hypothetical setup. Understands the fault in report creation.
		Interview	Interview Model	Understands the foundations of an interview (Can catch a partners.) Understands the structure of a solution model and can use it. Understands the structure of a needs anticipation model and can use it. Understands and can practice the tips that make it easy to speak about.
			Flexibility	Understands and can practice the the interview method corresponding to an interviewed person. Understands and can practice the foundations of the questioning method.
			Listening	Understands the importance of listening for the right understanding or recognition. Understands the basic position and methodology of listening.
		Situation Response	Meeting Management	Understands a series of meeting management processes from the setup to the adjustment of a result. Can adjust various opinions that lead to a result.
			Public Relation	Understands the principle of the ideal information dispatch towards every direction in and outside the company. Understands the foundations of suitable media and technique on the occasion of the communication undertaken in an organization.
	Leadership			
		Leadership	Fundamental Knowledge of Leadership	Understans the featires of great leader, and four fundamental leadership styles.
			Effective Leadership	Understands what is kept in mind, when taking communication with a member, and can motivate a member who can build a confidential relation, and can support the training.
		Members Promotion	Understanding of Coaching	Understands the method of effective instruction or advice.
			Coaching	Can undertake coaching others.
			OJT(On the Job Training)	Can stand the carrier plan suitable to subordinate's aptitute and support it. Can make a suitable instruction at an appropriate timing through business every day.
		Team Management	Fundamental Knowledge of Team Management	Understands the difference with instruction of one to one. Master the basic knowledge searched for on the occasion of team management.
			Management by Objective	Understands the process and point of management by objective. Can carry out this management process and lead a team to goal achievement.
	Negotiation			
		Negotiation	Negotiation Technique	Understands and can practice the technology and the process of negotiation, negotiation, and dealings.
			Logical Thinking	Can persuade others logically. Know the point and the feature of a logical thinking method.
	Management			
		Management Model and Theory	Fundamental Management Method and Theory	Understands the fundamental technique and theory that the management of the organization is required to follow

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System Platform				
	OS (Operating System)			
		Windows XP Professional (Basic)	Installation of Windows XP	Can make an installation and a check of an operation of XP Professional.
			Desktop Environment Configuration	Can set up and manage the environment of a desktop computer for daily business.
			Use and Management of User Account	Can create a user account, create a user profile, create a group account, and assign user rights.
			Use of Network	Understands the fundamentals of the composition of a TCP/IP protocol and TCP/IP, and can make a connection with a network.
			Operation in Microsoft Network	Understands the network configuration (workgroup, domain). Understands the outline of ActiveDirectory and can make a participation of a domain and logon. Can make use of active directory.
			Disk Management	Can create a partition. Can carry out the formatting of a disk.
			Use and Management of Resource	Can make a setup about connection with an NTFS access permission, a shared resource, and a shared resource etc.
			Printer Use	Can make use of a local printer and a network printer.
			Trouble Shooting	Can carryout the troubleshooting of a boot process and other system problems.
		Windows XP Professional (System Management)	Installation of Windows XP Professional	Can carry out an installation and a check of an operation of XP Professional.
			Use, Setup and Management of User Account	Can create a user account, create a user profile, and create group account. Can make a setup of property of useraccount. Can carry out the setup of a group.
			Install and Conposition of Network Protocol	Can carry out installation of a network protocol, composition, and troubleshooting.
			Use of DNS Service and Active Directory	Understands DNS, name resolution, DNS client, and active directory.
			Setup, Conposition and Management of Printer	Can carry out setup, composition, and management of a network printer.
			File Management	Can manage and retrieve a file. Can manage the protection of a file and a folder. Can undertake the encryption of the proprietary information.
			Install, Uninstall and Management of Program	Can carry out installation of a program, uninstallation, and management.
			Install and Management of Hardware and Device Control	Can carry out automatic installation of hardware and manual installation. Can carry out the composition and troubleshooting of hardware. Can carry out the check of a hardware profile.
			Check of Resource and Event	Can carry out the planning and mounting of check policy. Can make use of an event viever.
			Security Setup and Composition of Internet Option	Can carry out composition of an account policy, composition of a user right, and composition of a security option.
			Management of Data Storage Domain	Can carry out a compressive management and a management of a disk quota. Can carry out the strengthening of the security by EFS.
			Check and Management of Network Resource	Can check and manage a network resource.
			Backup and Restoration of Data	Can carry out the backup and the restoration of a data.
			Network and Internet Connection	Can carry out networking and connect to Internet.
			Change of Boot Process and Trouble Shooting	Can make a change of a boot process and carry out a troubleshooting.
		Windows Server 2003 (Basic)	Installation of Windows Server 2003	Can carry out an installation of Windows Server 2003.
			TCP/IP by Windows Server 2003	Understands the composition of TCP/IP, DNS, DNS domain, and TCP/IP.
			Introduction of Active Directory	Understands the fundamentals of Active Directory and can introduce Active Directory.
			Object Management of Active Directory	Can carry out an object management by Active Directory.
			Resource Management	Can carry out various setup of a local resource and a shared resource.
			Printer Management	Can carry out a management of a setup of a print server, printer sharing, and a printer.
			Grouping Policy	Understands a grouping policy and can carry out various setup.
			Measure against Obstacle by Windows Server 2003	Understands the essentials of the measure against an obstacle and can protect of a disk (a basic disk/dynamic disk, mirror volume, and RAID-5 volume), the backup, and the shadow copy of a shared folder.
			Remote Management	Can carry out remote management (management of a computer, terminal service, and remote management by the browser).
		Windows Server 2003 (System Management)	Management of Account and Resource	Understands the outline of management of account and a resource, and carry out installation and composition of a management tool, creation of an organization unit, and movement of a domain object.
			Management of User Account and Computer Account	Can create a user account, create a computer account, and carry out a management relevant to them.
			Grouping Management	Can create a group and carry out a management relevant to them.
			Access Control to Resource	Can managet access to resources.
			Setup and Control of Printer	Can manage installation of a printer, installation of a printer driver, printer sharing, an access permission, etc.
			Access Control of Organization Unit to Object	Can carry out the access control to the object of an organization unit.
			Mounting of Grouping Policy and Managemebt of User Environment	Can manage mounting of a grouping policy and manage the user environment using the grouping policy.
			Controlling Template Mounting and Check Policy	Can carry out mounting of the template for management and a check policy.
			Server Performance Check	Can check the server memory, the usage rate of a processor, a disk, and a network usage rate.
			Device Driver Maintenance	Can carry out maintenance of a device driver.
			Disk Management	Can carry out management of the property of a disk, management of a mounted drive, conversion of a disk, creation of volume, and import of a disk
			Data Storage Domain Control	Can carry out file compression, file encryption, and mounting of disk quota.
			Trouble Resroration Management	Can carry out management about backup of data, restoration of data, and other trouble restorations.

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		Windows Server 2003 (Network Management)	TCP/IP Protocol	Understands the outline of OSI model and TCP/IP model. Can display a frame using a network monitor.
			IP Address Assignment in Multiple Subnetwork	Can carry out assignments of the IP address in a multiple subnet.
			Routing Configuration Using Routing and Remote Access	Can create the routing composition that uses routing and remote access.
			Composition of Client and IP Address	Can create the composition of the IP address of a client.
			Management and Check of IPAddress Using DHCP	Can assign the IP address that used the dynamic host configuration protocol (DHCP), and can manage it and make the check.
			Name Solution	Understands the structure of a name resolution and can create the composition of host name solution and the composition of NetBIOS name solution.
			Solution of Host Name Using DNS	Can install domain name system (DNS) server service, and create related composition.
			Management and Check of DNS	Can manage and check DNS.
			Solution of NetBIOS Name Using WINS	Can install Windows Internet name service (WINS) server service, and create the composition of solution of a NetBIOS name.
			Security Protection of Network Traffic Using IPSec and Certificate	Can mount security protection of the network traffic that uses IPSec and a certificate.
			Composition of Network Access	Can create the composition of network access.
			Management and Check of Network Access	Can manage and check network access.
			Identification of General Connection Problem	Can specify a related problem to general connection.
		UNIX/Linux(Basic)	Outline of UNIX and Linux	Understands the outline, such as history of UNIX and Linux, the application field of UNIX and Linux, the difference between UNIX and Linux, etc.
			Command	Can input the fundamental command of Linux.
			File and Directory Operation	Understands a file and a directory and can execute the command that operates these. Understands the protection function of a file and can make an appropriate setup. Understands a standard input/output and can use a redirection and a pipeline.
			Screen Editor (vi)	Can use vi editor.
			Shell	Understands the concept and the basic functions related to a shell. Can make an effective processing of a file (sed/awk). Can make a setup of a user environment.
			Shell Programming	Can create a shell script combining the grammar of various commands and a shell script.
			File Processing by Filter	Understands the filter command and the normal expression.
			Use of Network	Understands a network command and can input it.
		UNIX/Linux (System Management)	Linux Installation	Can install Linux.
			System Control Command	Understands the command in connection with user management, disk management, network management, and process management, and can use it.
			Setup of Network Environment	Understands the basic knowledge about LAN or TCP/IP, and can make a setup of starting of service, routing.
			Various System Setup File	Understands the configuration file of a demon and can set up the fundamental configuration, such as an automatic start.
			Kernel Tuning	Can set up and check a tunable kernel parameters.
			Kernel Reconfiguration	Can reconstruct the karnel from a source code.
			Data Backup/Restore Command	Understands the command in connection with data backup, restoration and archive.
			Log Management	Understands the various logs represented by syslog, and can set up a log, and carry out an analysis and a management.
			Application Management by make	Can carry out introduction and management of application software using make.
			Application Management by rpm	Can carry out introduction, updating, deletion, and present condition check of application using rpm.
			Trouble Shooting	Can respond to the collection of a trouble information, analysis, and solution about the trouble of starting processing, the trouble under system management, and a network disturbance.
		μITRON (Basic)	Outline of μITRON	Understands the outline of μITRON
			Equipment Selection	Understands the outline of devices using μITRON and can select an appropriate device.
			Mounting (Basic)	Can perform the fundamentals of mounting (example: TOPPERS, and JSP) of μTRON specification.
			Understanding of Function (Basic)	Understands fundamentals about the following functions of Real Time OS; task management function, task attached synchronous function, synchronous communications between tasks, time management, management by exception, interruption management.
			RT Application Development (Basic)	Understands and can practice the foundamentals of the application development using Real Time OS.
		μITRON (Intermediate)	Mounting	Can carry out the details of mounting (example: TOPPERS, JSP etc.) of μTRON specification.
			Understanding of Function	Understands fundamentals about the following functions of Real Time OS; task management function, task attached synchronous function, synchronous communications between tasks, time management, management by exception, interruption management.
			RT Application Development	Understands and can practice the details of application development using Real Time OS.
		iTRON (Basic)	Outline of iTRON	Understands the outline of iITRON.
			Equipment Selection	Understands the outline of devices using iITRON and can select it.
			Specification Design	iCan carry out the easy specification design using iTRON.
			Mounting	Can carry out the fundamentals of mounting of iTRON specification.
			Outline of RT Application (Basic)	Understands the fundermantals of the concept of RT application (RT nature, restrictions of resources, the development method, etc.).
			RT Application Development (	Can make the fundamentals of construction (cross compiler, remote debugger, etc.) of the development environment of RT application. Can make the fundermantals of development of RT application.
		iTRON Intermediate	Mounting	Can carry out the details of mounting of iTRON specification.
			Outline of RT Application	Understands the details of the concept of RT application (RT nature, restrictions of resources, the development method, etc.).
			RT Application Development	Can make the details of construction (a cross compiler, a remote debugger, etc.) of the development environment of RT application. Can make the details of development of RT application.
		Embedded Linux (Basic)	RTOS (Real Time OS)	Understands the RTOS(Real Time OS).

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			Linux Kernel	Understands Linux kernel. Understands starting of Linux.
			Distribution	Understands the types and features of embedded Linux distribution.
			Hardware (Basic)	Understands the fundamentals of the control methods, such as a new device and IC.
			Start Up (Basic)	Understands the fundamentals of the structure of BIOS. Can create an easy bootstrap and set it up. Can create an easy loader and set it up.
			Outline of RT Application (Basic)	Understands the fundamentals of the concept of RT application (RT nature, restrictions of resources, the development method, etc.).
			RT Application Development (Basic)	Can carry out the fundamentals of construction (cross compiler, remote debugger, etc.) of the development environment of RT application. Can carry out the fundamental development of RT application.
		Embedded Linux (Intermediate)	Hardware	Understands the details of control method, such as a new device and IC.
			Function Selection	Can select OS to be used (network, the sound, graphics, etc.) and applications (Network Servers, such as Web/DNS/mail/ftp/samba, X-Windows, etc.) from the hardware.
			Start Up	Understands the details of the structure of BIOS. Can create a complicated bootstrap and set it up. Can create a complicated loader and set it up.
			Outline of RT Application	Understands the details of the concept of RT application (RT nature, restrictions of resources, the development method, etc.).
			RT Application Development	Can make the details of construction (cross compiler, remote debugger, etc.) of the development environment of RT. Can make the details of development of RT application.
		Windows CE Basic	Outline of Windows CE	Understands the development circumstances and the outline of Windows CE.
			Kernel (Basic)	Understands the fundamentals of the outline of small kernel.
			Interface (Basic)	Understands the fundamentals of the user interface about Windows CE.
			Equipment Selection (Basic)	Understands the products corresponding to the processor architecture, such as x86, ARM, MIPS, SH and select them in an easy case.
			Specification Design (Basic)	Can carry out the fundamental specification design that suited the equipment.
			Mounting (Basic)	Can carry out the fundamental mounting of Windows CE.
		Windows CE Intermediate	Kernel	Understands the details of a small kernel.
			User Interface	Understans the details of user interface about Windows CE.
			Equipment Selection	Understands the product corresponding to the processor architecture, such as x86, ARM, MIPS, SH, and select it in a complicated case.
			Specification Design	Can carry out the details of specification design that suited equipment.
			Mounting	Can carry out the details of mounting of Windows CE.
	System Platform Technology			
		Hardware Architecture	Processor Architecture	Understands the structure of processor, the principle of an operation, the interruption control, the microprogram control, the high speed system and the structure of an operation, the multiprocessor, and performance of a processor etc.
			Memory Architecture	Understands memory cache, hit ratio, memory mapping system, the capacity and the performance of memory, the type of memory, the composition of memory, etc.
			Auxiliary Storage	Understands the storage medium, the type and the feature of an auxiliary storage unit, the calculation of performance and capacity of an auxiliary storage unit, etc.
			Input Output Architecture and Device	Understands input/output interface, the type and the feature of an input, output device, the type and the feature of a communication control unit, the connection method and the connection medium of an input/output device, and communication equipment, , etc.
		Transaction Processing	Form of Transaction Processing	Understands the transaction processing form.
			Transaction Processing System	Understands the middleware of transaction processing.
	System Configuration			
		System Configuration Techn	Client Server System	Understands the second layer, the third layer, the multi-layer, RPC, and the stored procedure.
			Distributed DB (Database) Sy	Understands the distributed DB (Database) system
			System Configuration	Understands dual system, duplex, hot standby, fault tolerant, honey combination, loose coupling, the array, the tandem, etc.
		System Performance	Application of Queing Theory, Performance Calculation	Understands and can apply response time, a throughput, and TAT(Turn Around Time).
			Performance Design	Understands and can apply tuning of a system, the law of Amdahl, and the response characteristic.
			Performance Index	Understands SPECint, SPECfp, TPC, Gibson mix, and response time.
			Performance Evaluation	Understands a benchmark and a system monitor and can carry out a carry outance evaluation.
			Capacity Control	Can undertake capacity management.
		Reliability and Economical	Reliability Calculation	Understands operating ratio calculation, MTBF, MTTR, availability, a failure rate, and FIT, and can carry out reliability calculation.
			Reliability Design	Understands and can apply a failsafe, a fail soft, and a roof proof.
			Reliability Index	Understands RAS(Reliability, Availability, Serviceability), RASIS(Reliability, Availability, Serviceability, Integlity, Seculity), a bathtub curve, and an nonstopping operation.
			Reliability Evaluation	Can evaluate a reliability.
			Economical Efficiency	Can evaluate system profitability and operating ratio.
	System Platform Requirement Definition			
		CPU Performance Estimation	Load Estimation	Can estimate the amount of data generated on business quantitatively.
			Throughput Estimation	Can compute system load from the amount of data generated on business.
		Storage Capacity Estimation	Data Quantity Evaluation	Can estimate the amount of data generated on business in consideration of a required maintenance period.
			Storage capacity Estimation	Can estimate the amount of storage for storing the abovementioned required data.
		Transmission Capacity Estimation	Transmission Capacity Estimation	Can calculate systematic amount of real transmissions based on the amount of data generated on business.
		Transaction Quantity Estimation	Transaction Quantity Estimation	Can calculate systematic amount of transaction per second based on the amount of data generated on business.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Response Estimation	Unit Processing Time Estimation	Can estimate the processing time in an unloaded condition.
			Service Processing Time Estimation	Understands a queuing model and can estimate the service processing time at the time of load.
	Platform Design			
		Platform Design and Estimation/Selection	Platform Design	Can design the platform realizing processing needed on business.
			Platform Selection	Can evaluate and select the platform realizing processing needed on business.
		Platform Physical Configuration Design	Software Configuration Design	Can design the software configuration (OS, middleware, etc.) that realizes processing required of disposal of business affairs.
			Hardware Configuration Design	Can design the hardware configuration (personal computer, server, storage, network equipment, etc.) that realize processing required of disposal of business affairs.
	Planning of System Introduction and Migration			
		Management of Introduction and Migration Planning	System Introduction, Planning of Migration	Understands bases, such as hardware, OS, and middleware, and can introduce the whole system, and draw up a shift plan.
			System Introduction, Migration Work Management	Understands bases, such as hardware, OS, and middleware, and can introduce the whole system, and can manage work of shift.
		Operation Environment Setup	System Operation Environment Design	Can design the optimal various parameters for system operation.
			System Operation Environment Setup	Can set up and evaluate the optimal various parameters for the system operation.
		System Change Management	Management Rule Creation	Can create the change rule at the time of system change.
			Change State Management	Can manage the change state of a system appropriately.
		Determination of System Level Requirement	Determination of System Level Requirement	Can calculate the service level that it requires on business.
			Service Level Estimation	Can evaluate the service level of a real operation system.
	System Evaluation Method			
		Qualitative Estimation Method of Reliability and Service Level	System Reliability Estimation	Understands prediction and an evaluation technique of the reliability of a system, and can predict and evaluate.
			Service Level Estimation	Understands the technique and a principle for raising the working ratio of a system, and ca evaluate a service level.
		Data Collection, Analysis and Evaluation	Data Collection and Analysis of Real Operation Data	Can collect and analyse the operation data of a system, and can indicate the problem.
		Performance Tuning and Bench Marking	Performance Evaluation	Can use the bench marking technique etc. and can make a survey and evaluate a processing performance.
			Performance Tuning	Can analyse a quality assessment result and solve a performance problem.
	Server Application			
		Web Server	Web Server Function	Understands the functions of a Web server.
			Apache Setup	Understands the functions of Apache and can set it up.
			IIS Setup	Understands the functions of IIS(Internet Information Services) and can setup it.
		Mail Server	Mail Server Function	Understands the functions of Mail server.
			Sendmail Setup	Understands the functiosn of Sendmail and can set it up.
			Qmail Setup	nderstands the functions of Qmail and can set it up.
		Directory Server	Directory Server Function	Understands the function of a directory server.
			Active Directory Setup	Understands the function of an Active Directory and can set it up.
			Open LDAP Setup	Understands the function of LDAP(Lightweight Directory Access Protocol) and can set it up.
		Print Server	Print Server Function	Understands the funcion of a print server.
			Setup on Windows	Can set up a print server for Windows.
			LPD Setup on lpd	Can set up lpd (line printer daemon).
			CUPS Setup	Can set up a CUPS (Common UNIX Printing System).
		DNS Server	DNS Server Function	Understands the function of DNS(Domain Name System) server.
			BIND Setup	Understands the function of BIND(Berkeley Internet Name Domain) and can
			Dynamic DNS Setup	Understands the function of Dynamic DNS and can set it up.
		FTP Server	FTP Function	Understands the function of FTP(File Transfer Protocol).
			wu_ftp Setup	Understands the function of wu_ftp and can set it up.
			ProFTP Setup	Understands the function of proftp and can set it up.
		SMB Server	File Server Function	Understands the functions of a file server.
			Permission	Understands the functions of the permission of a file server and can set it up.
			Window Server Sewtup	Understands the file server of the Windows system OS and can set it up.
			SAMBA Setup	Understands the functions of SAMBA and can set it up.
		NFS Server	NFS Functions	Understands the functions of NFS(Network File System).
			NFS Setup	Understands the functions of NFS and can set it up.
	Server Construction			
		Load Balance Server	Function of Load Balance Server	Understands the functions of a load balancer. (When there is a variation in the capability of a server, a load balancer with advanced functions, such as transmitting a demand according to the reaction velocity of each server, is required.)
			Setup of Load Balance Server	Has the product knowledge of a load balancer and can set up a load balancer, and can carry out the optimization according to an operational
		Application Server	pplication Server Functions	Understands the functions of an application server. (An application server mounts business logic that has a connection function to the execution environment and the database of a program, a transaction management function that connects two or more processings, etc., and controls the flow of processing of business.)
			Setup of Application Server Function	Can set up an application server.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
Database				
	General Database System			
		Database Usage	Fundamental Structure of Database System	Understands outlines, such as a life cycle of system catalog, relational table, data dictionary, database use language, and data.
			Role of Persons Concerning Database System Construction	Understands the data administrator, the data modeling engineer, a database design and a construction engineer, the database operations manager, and the database administrator.
		Basic Functions Related to Database System	System Catalog Maintenance Function	Understands the method of the self-description about database, and system catalog maintenance (based on DDL(Data Definition Language)).
			Execution Function of Extraction and Storing of Relational Table	Understands the execution functions of extraction and storing of a relational table.
			Interpretation Function of Database Use Request (SQL)	Understands the interactive use (QBE(Query By Example), command line), and the use by a program (general language and database use language).
			Recording Function of Database Use	Understands the recording function of a database use.
			Backup Recovery Function of Database Use	Understands the outline of the backup recovery function of a database.
			Integrity Secured Function	Understands the integrity secured function.
		Relational Model	Relational Modeling Technology	Understand what is made by a relational model, and what a relational model is carried out.
			Relational Model Component	Understands a relationnal (table), an attribute (line, field), a group (line, record), the definition domain, degree, cardinality, and a relational key (main, super, candidate, exterior).
			Integrity Rule	Understands the entity integrity, the reference integrity, the domain integrity, and the user definition integrity.
			Normalization	understands the definition of normalization, the advantage of normalization, the function subordinacy in a normal form and the use of key, and, and the method describing a normal form (first normal form - third rnorma form, Boyce-Codd Normal Form, the fourth normal form, fifth normal form).
			Relational Model Relationship	Understands one-to-one relation, one-to-many relations, and many-to-many relations.
			Data Operation	Understands the relational algebra (addition, subtraction, product, direct product, selection, projection, combination, quotient) and related calculation (Tuple Oriented, Domain Oriented).
			View	Understands the definition of the view in a relational model.
			Database Mounting Rule	Understands the fundamental rule, the structural rule, the integrity rule, the data manipulation rule, and the data independence nature rule.
	Database Language			
		SQL	Database Language	Understands the requirements that should be equipped with database language, and the type and the feature of a database language.
			SQL Outline	Understands the feature of SQL(Structured Query Language), and the basic language element of SQL.
			Database Definition	Can create a database(CREATE TABLE), a table(CREATE DATABASE) , a data integrity, a change of a table definition(ALTER TABLE), a deletion of a table (DROP TABLE), the definition of a view(CREATE VIEW), a deletion of a view(DROP VIEW), and a deletion of an index(DROP INDEX).
			Data Operation	Can undertake processing of a single table, processing of two or more tables, data change, and the attribute definition of data (type: a character, a bit, a numerical value, a date, an interval).
			Integrity Operation	Can define a domain (CREATE DOMAIN) and operate an assertion (CREATE ASSERTION).
			Trigger and Procedure	Understands the functions of a trigger and can create a trigger (CREATE TRIGGER).
			Type of SQL Issue	Understands and can use interactive SQL and the embedded types SQL (dynamic SQL, cursor control) and API.
			SQL Standardization	Understands the aim of database language standardization, the history of SQL standardization, and the specification of the third generation SQL.
	Database Design and Implementation			
		Database Requirement Definition	Present Condition Investigation and Poblem Analysis	Understands and can implements the investigation and analysis of present condition, and subject analysis.
			Work Range Determination	Understands the work range and can define the work range.
			Database Design Requirement	Can create the requirements for data (the type of data, size and capacity of data) and the requirements for an integrity.
			DatabaseOoperation Management Requirement	Can create the requirements for data access, the requirements for performance, a security requirement, the requirements for a platform, and the requirements for employment (a surveillance program, an operational environment).
		Conceptual Model Creation	ER Model Concept	Understands an entity (a type, an instance, a strong entity, a weak entity), an attribute (a simple attribute, a complex property, a single value attribute, a multivalued attribute, a derivation attribute, a candidate key, a primary key, a composite key), relation (a type, an attribute, flexibility), data restrictions (identifier restriction, formal restrictions, reference restrictions, existence restrictions, the multiple degree restrictions, derivation restrictions, related restrictions, updating restrictions, processing order restrictions), generalization, specialization, a spur-type, subtype, a business rule, and the expression method of ER model.
			Approach of Data Analysis and Modelling	Understands top-down approach, bottomup approach, and mixture approach.
			Conceptual Data Modeling	Understands discrimination of an entity, key discrimination, entity-related discrimination, discrimination of a business rule, and the compatibility check of a data model and a business process, and can create a conceptual model.
			Verification of Conceptual Data Model Including User	Can verify the conceptual data model including user.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Logical Model Creation	Logical Data Model Conversion	Can carry out an access analysis, the design of table (unregularization (redundancy), combination of a table, taking in of a derivation item, division of a table, the method of mounting subtime, summary entity) , the design of index (the effect of a UNIQUE index, a Non-UNIQUE index, single type search and a connected type index, effect of an index, use of an index) , and the design of a view
			Logical Data Model Verification	Can verify a logic data model.
		Database Physical Design	Physical Environment MM CPU Disk i/o N/W	Understands physical environment (MM, CPU, Disk input/output, N/W).
			Transaction Analysis	Can analyze the requirements for use (an amount of data, data use), specification of critical processing (a basic system, an information system), and specification of bottleneck processing (the number of times of access, updating frequency, access path).
			Database Design Requirement	Can arrange requirements for design, such as physical requirements (the size of a db file, the size of an updating log file, the growth possibility of a file) and requirements for an operation (a throughput, the number of items, record length, the number of records, the number of indexes).
			Constraint of Database Function	Understands the functions of a database(a data compression, an input/output system with AP, the unit of exclusive control, a recovery system), and the possible data structure (the structural type DB, a two-dimensional table, a nested integrity, backup recovery, an operation form).
			Architecture Design	Understands and can apply the selection of concentration/distribution, a concentrated database, and a distributed database.
			Conversion to Target Database Management System	Understands a field design (data type selection, a data compression, a data integrity), selection of an access path, unnormalization, use and selection of an index (index creation, use time of an index), calculation of the amount of required disk spaces, and can develop a real database.
			Lock	Understands and can apply the locking level (a database, a table, block/page, a record, a field) , the type of lock (common use, exclusion).
			Optimization	Understands the trade off of the improvement in efficiency (memory efficiency, access efficiency, and CPU time, file access by parallel processing (RAID processing)), application carry outance adjustment (query optimal processing, access path adjustment, thoroughness of conformity for application development rule), physical arrangement of data disk space assignment , the determination of an alternative database, the distribution to two or more disks, and order examination of storing data. Can carry out optimization of a database.
			Security Design	Understands the addition of a user and a group, and Granting of a roll and a privilege, and security, and can set them up.
		Development Environment	System Catalog	Understands the meaning of a system catalog, the contents of the system catalog, a data dictionary, and metadata.
			Information Resource Dictionary System	Understands the meaning of IRDS (Information Resource Dictionary System) (the necessity of IRDS, the relation between data dictionary/directory and IRDS), the standardization of IRDS.
			Information Resource Management	Understands the importance of IRS(Information Resource Management) and the relation with an enterprise model and IRM, and can manage the data administration in the IRM
			Repository	Understands the role of a repository, and the function and the feature of a repository, and the relation with a CASE tool and the repository.
		Database Implementation and	Database Definition	Can define a database (Create Database Create Tablespace).
			Table Definition	Can define a table (Create Table).
			View Definition	Can define a view (Create View).
			Index Definition	Can define the index that makes an access path select to a database and at
			Grant Definition	Can define a grant (GRANT ON TABLE).
			Data Loading	Can shift a data (data extraction, data conversion) and load a data.
			Test and Evaluation	Can carry out a database test and evaluation, carry outance adjustment, security and verification of an integrity, data backup and verification of recovery, and access of a database.
			Document Production	Can produce the description for users and the description for database operations managers.
	Oracle Database Management			
		Outline	Oracle Outline	Understands the outline and main function of an Oracle database.
			Environment Setup of Oracle SQL Client	Can carry out the introduction and environment setup of SQL*Plus that are the clients of Oracle.
			Oeacle SQL Operation (DDL, DML)	Can define a table and SQL input and output to Oracle through SQL*Plus.
			SQL*Plus Command	Can use a command particular to SQL*Plus.
		Installation	Installation	Can installe and set up the Oracle software.
		System Management	Instance Management	Can manage the memory domain and control file that Oracle uses.
			Schema Management	Can carry out a management of a user and can set it up.
			Table Domain Management	Can define an appropriate table domain.
			Other Management Item (Control File, REDO Log /File, UNDO Segment, Work Item of Manager)	Can manage a control file, a REDO log, and an UNDO segment Is mastered an administrator's work skill category.
			Performance Check	Can check Oracle performance.
		Backup and Recovery	Data Integrity	Understands the concept of a transaction and can use rollback/commit Understands compatibility of the data based on a REDO log/ control file.
			Online Backup	Can treat online backup.
			Offline Backup	Can treat offline backup.
			Export and Inport	Can treat export/import and understands difference from backup.
			Recovery Manager	Can treat recovery manager.
	DB2 Database Management			
		Outline	DB2 Outline	Understands outline and main functions of DB2 database.
			Relashonship Among Domino/WebSphere/Tivoli	Understands the cooperation method of each application and DB2.
		Installation	Installation	Can carry out an installation and set up the DB2 software.
		System Management	Instance Management	Can manage a database and database composition file that DB2 instance uses.
			Schema Management	Can carry out a management of a DB2 user and can set it up.
			Table Space Management	Can define an appropriate table space and a container.
			Performance Check	Can make a surveillance of performance of DB2.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Backup and Recovery	Data Integrity	Understands the concept of a transaction and can use rollback/commit.
			Backup	Can treat a backup.
	SQL Server Database Management			
		Outline	SQL Server Outline	Understands outline and main function of SQL Server database.
			Relashonship with .NET	Understands the relation between NET and SQLServer.
		Installation	Installation	Can carry out an installation and set up the SQL Server software.
		System Management	Instance Management	Understands a server composition parameter and can set it up in an appropriate way..
			Database Management	Understands an architecture of a database and can treat a management task.
			Security Management	Can carry out a management of a user and set up an authority.
			Performance Check	Can make a surveillance of the performance of SQL Server.
		Backup and Recovery	Data Integrity	Understands the concept of a transaction and can use rollback/commit.
			Backup	Understands the type and the directions for backup and can execute it by an appropriate method.
			Recovery	Understands the restoration method and can execute an appropriate recovery according to the backup method.
	PostgreSQL Database Management			
		Outline	PostgreSQL Outline	Understands outline and main functions of Postgre SQL database.
		Installation	Installation	Can carry out an installation and set up the Postgre SQL software.
		SQL Setup and Operation	SQL Setup and Operation	Can set up the Postgre SQL server.
	MySQL Database Management			
		Outline	MySQL Outline	Understands outline and main functions of MySQL database.
		Installation	Installation	Can carry out an installation and set up the MySQL software.
		SQL Setup and Operation	SQL Setup and Operation	Can set up the MySQL server.
	Database Programming			
		OraclePL/SQL	PL/SQL Outline	Understands the outline of Oracle PL/SQL database.
			Stored Procedure	Can create a stored procedure.
			Stored Package	Can create a stored function.
			Oracle Supplied Package	Can use the Oracle offered PL/SQL package in application development (a screen output, a file output, a Web output, an E-mail output).
			Dynamic SQL	Understands a dynamic SQL.
			Trigger	Can apply the triggar function.
			PL/SQL Compiler	Can operate PL/SQL compiler.
		SQL Server 2000	SQL Server Programming Outli	Understands the outline of programming by Transact-SQL.
			Creation and Management of D	Can create and manage a database, and create and manageme a data type and a table.
			Data Integrity Setup	Can execute the data integrity.
			Index Creation and Maintenar	Can carry out a creation and a maintenance of an index.
			View Setup	Can ser up a view
			Stored Procedure Setup	Can design, create, and use a stored procedure.
			Trigger Setup	Can create a triggar and set it up.
			User-defined Function Instal	Can set up a user-defirned function.
			Query Analysis, Optimizatio	Can analyss a query and carry out its optimaization.
	Database System Development Technology			
		Distributed Database	Distributed Database Concept	Understands the meaning of a distributed database, the definition feature, a classification (the homogeneous distribution DBMS, heterogeneous distribution DBMS), a characteristic function, the strong point, demerit, etc.
			Data Distribution Strategy	Understands and can apply the fragmentation of data, the allocation of data, and the distribution of a data dictionary.
			Distributed Query Processing	Understands and can apply division of a query, and optimization of a query.
			Distributed Transaction Processing	Understands and can apply reliability and security.
			Distributed Database Recovery	Understands and can apply the influence of recovery from the trouble in distributed environment, and two-phase commitment (2PC), and three-phase commitment (3PC).
			Replication	Understands and can use the replication concerning the function, an advantage, and timing (synchronous replication, asynchronous replication).
			Penetration of Distributed Database	Understands location penetration, fragmentation penetration, replication penetration, transaction penetration, obstacle penetration, concurrency penetration, performance penetration, and DBMS penetration.
		Database Security	Understanding of Security Po	Understands the database security and the data security level (primarily important, important, requiring care, and arbitrary) that are seen from the security policy.
			Database Security Measure	Understands the access control to a user (use of a password etc.), the access control by a program (restriction of program inclusion SQL instructions etc.), the access control functions of a table (setup of a user view etc.) and the access restrictions (it is a setup of use restrictions etc. according to object resources yesterday) of operation, and encryption/decryption of external storage data.
		C/S(Customer Satisfaction) System and DBMS	Multi-user Database Environment	Understands and can apply the file server architecture and the C/S (client/server) architecture (the database server architecture, the merit of the C/S architecture, a three-tiered architecture).
			Large Scale Database and Parallel Computing Architecture	Understands SMP(Symmetric Multi Processing) and MPP(Massively Pararell Processorarchitecture).
			Role of Middleware	Understands the role of the middleware.
			C/S Problem for Technical Engineer (db)	Understands the exact grasp of business needs, analysis of the architecture, realization of scalability, the range of service or support, the analysis power of the intelligent network of a database (stored procedure, trigger), and total cost.

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	Database Related Technology			
		Data Warehouse	Data Warehouse Meaning	Understands the new type of query of a database (the practical using needs of new database in the information system), competition predominant information resources, and the limit of the present database system and data warehouse.
			Data Warehouse Application	Understands application domains, such as an executive information system (EIS), a decision support system (DSS), and analysis business by a nonuniform inquiry.
			Fundamental View of Data Warehouse	Understands the fundamental view of data warehouse.
			Data Warehouse Architecture	Understands the operation data, the data for nonuniform inquiry, the data warehouse and data mart, the feature and use of a metadata, a report generation tool, a multi dimensional database, and online the analytical processing (OLAP).
			Data Warehouse Design	Understands and can apply requirement analysis, equirement definition, and modeling technology (a star schema, a snow flakes schema, and multi-dimension modeling meta model), creation of a high level data model (high level ERD), creation of an end user demand report, creation of a logic data model, and mapping to a physical data model from a logic data model.
			Setup Preparation	Understands the estimate of a disk storage capacity, the determination of a processor, the maintenance plan of metadata, and the distribution of data (setting position, division, and replication).
			Data Warehouse Construction	Can carry out the data extractraction from source data, data conversion, and maintenance of a data integrity.
			Correspondence to Performance Problem	Can carry out optimization of storage and optimization of a query.
			Data Warehouse Maintenance	Can carry out a maintenance and a management of a data warehouse.
		Online Analysis Processing (OLAP)	Meaning of Online Analysis Processing	Understands the advantage of OLAP(Online Analytical Processing), the limit of OLAP, and comparison of OLTP (Online Transaction Processing) and OLAP (difference in the reporting function of OLAP and a standard analysis).
			Multi-dimentional Database	Understands the operation of a multi dimensional database (MDD;Multi Dimensional Databese).
			Online Analysis Processing	Understands and can use the multi-dimensional OLAP and a tool (MOLAP), and relational OLAP, and a tool (ROLAP).
			OLAP Logical Design	Can define a user demand and an environmental analysis, a cube, a dimension, a class, and a link, the number of dimensions, and the collection and the derivation method.
		Data Mining	Meaning of Data Mining	Understands the predominancy of the data mining, and the use phase of the data mining.
			Data Mining Tool	Understands and can use the evaluation of a data mining vendor, and five classifications (a connection, an order, a classification, a cluster, a prediction) of a data mining tool.
			Data Mining Technique	Understands and can use the discovery of a rule, the signal processing, a neural network, and a fractal.
			Data Mining Application	Can use the data mining application.
		Object-Oriented and Database	Object-Oriented Analysis Design and Database	Understands and can apply data oriented design, an object oriented design (a structured design, from a data oriented design to an object oriented design), ER(Entity Relationship) diagram, and a class diagram (the data modelling technique from ER diagram to the class diagram).
			Correspondence of Object to Relational Model	Understands and can apply the mapping of a table and a class, the addition of the identifier of an object, and the expression by the combination of a succession and a concentration.
			Programming Language and Database	Understands and can apply the object-oriented program language and SQL, flattening and the reconstruction of an object in a database management system
			Merit of Object-Oriented Database Maintenance System	Understands the affinity with an object-oriented model and a programming language.

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Network				
	Network Technology			
		Network Technology	Basic Knowledge of Network Use	Understand the use of network, and the type of network. Has basic knowledge of the network.
			Communication Protocol	Understands the foundation of the meaning of a communications protocol, OSI (Open Systems Interconnection) reference model, and TCP/IP.
			Address	Understands outline of the meaning of an address, a MAC Address, an IP address, a port number, and a use image.
			LAN	Understands outline of LAN composition elements (standardization, a network topology, a transmission line, NIC, media-access-control system), LAN connection equipments (the type of equipment, a repeater, a hub, a bridge, a switching hub, router, etc.), and wireless LAN.
			WAN	Understands outlines of the form of use, the connection equipment, a data link layer protocol, and the WAN service.
			Network Security	Understands outline of the importance of security, a measure of typical unlawful access, the main security countermeasures, and the network technology and security.
		Protocol and Transmission Control	Network Architecture Outline	Understands outline of the network topology (a bus topology, a star topology, a ring topology), standardization of a communications protocol (layers of OSI), and an application layer protocol (FTP, TELNET, SNMP, DHCP, POP, SMTP), a transport layer protocol (TCP, UDP), network layer protocol: IP (IP address (a subnet address, subnet mask, class A-D, IPv4, IPv6), physical address (unicast, broadcasting, multicasting), data link layer protocol (ARP, PPP), and physical layer.
			Transmission Control Outline	Understands outline of a connectionless system, contention mode, polling and selecting mode, basic procedure, a multi-link procedure, a transmission control character, a circuit control, and HDLC and PIAFS.
		Coding and Transmission	Modulation and Coding	Understands AM, FM, PM, a sampling, QAM, an analog transmission, digital d
			Transmission Technology	Understands the error control (CRC, Hamming code, a parity check, ECC, and a checksum, and bit error rate), the synchronous control (a step-by-step synchronization, SYN synchronization, a flag synchronization, a frame synchronization), a multiplexing system (FDM, TDM, CDMA), compression and expansion system (JPEG, MPEG, MH, MR, MMR, Run Length, voice compression), SONET and SDH, etc.
			Transmission Method and Circ	Understands a communication method (simplex/half duplex/full duplex, seria
			Type of Cable	Understands a coaxial cable, a twisted-pair cable, and an optical fiber ca
		TCP/IP	TCP/IP Outline	Understands history of TCP/IP, standardization of TCP/IP, TCP/IP layed model, and a data format.
			IP	Understands functions and features, an IP address, effective use of the IP address, routing (path control), and division and the reconstruction of an IP datagram, etc.
			ICMP and ARP	Understands functions and role of ICMP, and ICMP message.
			TCP and UDP	Understands functions and feature of TCP, a port number, a connection control, window control, a flow control, a congestion control and function of and feature of UDP, etc.
			Routing	Understands creation of routing table, the type of a dynamic routing, RIP, OSPF, etc.
			Application Protocol	Understands protocols of a DNS, a WWW, an E-mail, a TELNET, a FTP, a SNMP, and a DHCP, etc.
		LAN	LAN Outline	Understands the type of a network, the classification of LAN, internetworking connection between LAN / Internet connection, technology trends of LAN, etc.
			Ethernet	Understands history and standardization of Ethernet, a frame format, the type of Ethernet, an access control (CSMA/CD system), a configuration rule, etc.
			LAN Switch Application	Understands the basic functions related to a LAN switch, a full-duplex communication, negotiation, measure against a trouble, etc.
			Router Application	Understands outline of a router, a route setup, a relay, a routing protocol, measure against a trouble, etc.
			VLAN/Later 3 Switch Application	Understands VLAN and a layer switch.
			L2 Redundancy	Understands L2 loop configuration. Understands redundancy protocols, such as STP.
			L3 Redundancy	Understands the role of a gateway. Understands redundancy protocols, such as VRRP and HSRP.
		Wireless LAN	Wireless LAN Outline	Understands outline of wireless LAN, such as a network topology of wireless LAN, the standard of wireless LAN, IEEE802.11a/b/g, and the security of wireless LAN etc.
			Wireless Lan Application	Understands the necessity for wireless LAN, device required for wireless LAN construction, and the function of an access point, and can dsign and setup a suitable wireless LAN network.
			Secure Wireless LAN	Understands the environment that surrounds a wireless LAN, the characteristic of a radio wave, and technical security (encription it based on WPA, the security by IEEE802.11i, access restrictions of wireless LAN clients, and the security technology above the network layer), and the physical security (consideration of an access point, radio wave exposure from a window etc.).
		WAN and Internet Circuit	WAN Basics	Understands outline of WAN, composition of WAN service, a communication line charge, and selection of a circuit etc.
			Basic Internet Circuit	Understands outline of Internet circuit, configuration of an Internet connection, selection of a circuit, etc.
			Leased Line Service	Understands the configuration of a leased circuit service, a dedicated line, high speed digital transmission service, connection interface, etc.
			Packet Switching Service	Understands outline of a packet switching, and packet switching service.
			ISDN Service	Understands outline of ISDN, ISDN service, connection devices, etc.
			Frame Relay service	Understands outline of Frame Relay, Frame Relay service, etc.
			ATM Dedicated and Cell Relay Service	Understands outline of ATM, ATM dedicated service, Cell Relay Service, etc.
			Wideband Ethernet Service	Understands outline of VPN (Virtual Private Network), broadband Ethernet service, etc.
			IP-VPN Service	Understands MPLS (Multi-Protocol Label Switching), IP-VPN service, etc.
			ADSL	Understands outline of ADSL, ADSL, and the selection of a circuit, and connection devices.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			FTTH	Understands outline of FTTH, FTTH, and connection devices.
			CATV	Understands outline of CATV, CATV, and connection devices.
			Internat Authentification P	Understands PPPoA(Point-to-point protocol over AAL5) and PPPoE(Point-to-point protocol over Ethernet).
			Internet VPN	Understands related problems of security in the Internet. Understands security protocols, such as IPSec(Security Architecture for Internet Protocol).
		Network Component	NIC(Network Information Center)	Understands the functions of NIC(Network Information Center).
			Cable	Understands the type of a cable, and the specification.
			Repeater	Understands the functions of a repeater.
			Hub	Understands the functions of a repeater hub.
			Switch	Understands the functions of a LAN switch.
			Bridge	Understands the functions of a bridge.
			Router and L3 Switch	Understands the functions of a router and L3 switch.
			Firewall	Understands the functions and the type of a Firewall.
			IDS and IPS	Understands the functions of IDS(Intrusion Detection System) and IPS(Intrusion Prevention System).
			Gateway	Understands the functions of a gateway.
		VoIP	VoIP Outline	Understands outline of VoIP(Voivce over Internet Protocul), the Internet telephone, the feature of VoIP, merit of VoIP introduction, etc.
			Voice Transmission Protocol	Understands RTP(Realtime Transport Protocol) and RTCP(RTP Control Protocol).
			VoIP Signalling Protocol	Understands outline of H.323, outline of MGCP, outline of Megaco (Media Gateway Control) / H.248, outline of SIP(SMDS Interface Protocol), etc.
			Voice Coding and Quality	Understands voice quality evaluation, voice quality requirements of an IP phone, Codec, delay, Jitter, packet loss, an echo, QoS(Quality of Service), etc.
			VoIP Network	Understands a provider of VoIP network, VoIP network of a company, etc.
			VoIP Equipment	Understands VoIP server, VoIP gateway, and VoIP device, etc.
			VoIP Security	Understands security of VoIP, security in a VoIP device security in a VoIP server, etc.
		IPv6	IPv6 Outline	Understands the limit of IPv4, feature of IPv6, and definition of an IPv6 system etc.
			IPv6 Header	Understands structure of IPv6 header and improving points from IPv4.
			IPv6 Addressing	Understands addressing system of IPv6 and can identify use scene of each address.
			ICMPv6	Understands the functions and the role of ICMP(Internet Control Message Protocol)v6 and can identify use of ICMPv6 and contents of a message.
			Neighbor Search	Can follow the process of a neighbor search and the flow of automatic address composition.
			IPv6 Shift	Understands a shift technology to IPv6.
	Network Design			
		Requirement Definition	Construction Requirement	understands functional requirements, requirements for reliability, requirements for extendibility, requirements for performance, requirements for security, requirements for economical efficiency, requirements for connection between networks, requirements for an interface with application, and requirements for operation and maintenance, and can define them
		Logical Design	Construction Requirement Grasping	Can carry out the check of the specification required for a network.
			Network Construction Model	Can create a network composition model suitable for realizing the design requirements.
			Network Architecture	Can determine the protocol stack combining what type of protocol to be used, and can fixed the interface position of a system element, and can determine the protocols that are treated with each interface.
			Addressing System	Can determine the application layer (an E-mail address, a homepage address, a telephone number, a packet switching connection number, etc.), the network layer (an IP address), etc.
			IP Address System	Can decide an addressing architecture of an IP address.
			IP Address Setup	Can decide an IP address.
		Physical Design	Construction Place Check	Knows the check point of the place where the network is to be built.
			Equipment Setup Place	Knows the check point of the setting place of equipments.
			Cable Length	Can carry out a grasp of the cable length and the check that it is within distance limit.
			Equipment Redundancy	Undesratand a dual method in the load distribution configulationn, module, and power supply.
			Circuit Redundancy	Understands redundant method of a circuit.
	Network Construction			
		Setup and Introduction	IP Address Setup	Can set up an IP address.
			LAN Setup	Can set up a LAN.
			Routing Setup	Can set up a routing.
			VPN Setup	Can set up a VPN.
			SNMP Setup	Can set up an SNMP.
			Redundancy Setup	Can set up a redundancy.
			Security Setup	Can set up a security.
			Cable Construction	Can construct a cable.
		Test and Evaluation	Test Plan Document Creation	Can probe all test items and can draw up a test plan document.
			Test Execution	Can perform a confirmation of communication.
			Evaluation	Can take action of an improvement when the achievement degree of a desired value is evaluated and the track record has not reached a target.
	Network Maintenance and Operation			
		Network System Operation and Maintenance	User Correspondence	Can carry out a user management, a user education, and a user consultation.
			Maintenance and Renewal	Can carry out planning and execution of upgrade.
			Backup and Data Recovery	Can carry out backup and recovery of data.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Network System Management	Network System Configuration Management	Can carry out the management of the newest state systematically of the management of composition apparatus (IP address, MIB2, RMON (Remote network MONitoring)), the software management, and a network composition diagram.
			Network System Check	Understands and can use the network management (SNMP, MIB2, RMON (Remote network MONitoring)), the performance surveillance using a tool (LAN monitor), the trouble surveillance using a tool, the security surveillance using a tool (intrusion detection system), the checkpoint of performance surveillance, the point of circuit trouble surveillance, and the checkpoint of security surveillance.
			Disaster Analysis and Recovery	Understands and implements (identifies) the focus of trouble analysis (LAN analyzer), the point of trouble shooting, acquisition and analysis of log information, a tool/commands (ping, netstat, nslookup, etc.), and check of communication route, and the point of a trouble report.
			System Performance Analysis	Understands and can practice the point of performance analysis of a system.
			System Intrusion Analysis and Correspondence	Can analyse a security infringement. Can correspond to illegal access. Can correspond to a computer virus.
		Network System Estimation	System Evaluation	Understands limit of performance, analysis of a potential problem, and the point of system evaluation, and can evaluate a network system.
			System Improvement Proposal	Understands a life cycle of a system, the economical efficiency of a system, extendibility of a system, and points of an improvement proposal, and can present an improvement proposal.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
Information Security				
	Information Security Fundamentals			
		Basic Information Security Concept	Information Security Importance	Understands an information security, the threat on computer use, and the security countermeasures that should be implemented.
			Computer Virus Measure	Understands what is required as a measure against computer virus.
			Illegal Access Measure	Understands what is required as a measure against illegal access.
			Corporate Ethics and Security Policy	Understands environment surrounding a company and a security policy.
		Information Resourse and Security Risk	Information Treatment Moral	Can arrange morals that should be protected when treating an information.
			Information Security	Understands necessity for an information security, and management of an information security.
			Threat to Information Society	Understands disclosure of proprietary information/personal information, infringement of copyright, computer virus, and disruptive behavior.
			Security Measure	Understands measures against computer virus, personal identification, encryption, and access control.
		Basic Risk Management Procedure	Security Management Outline	Understands outline of security management and a security policy.
			Security Policy Decision Procedure	Understands outline of a security policy decision procedure.
			Risk Analysis	Understands risk analysis and technique of risk analysis.
			Personal Information Protection	Understands protection of personal information and guideline of protection of a personal information.
		Information Security Related Terminology	Encryption	Understands meaning of terminologies of encryption, such as a public key, a secret key, DES, RSA, and algorithm of encryption, etc.
			Unauthorized Entry	Understands meaning of terminologies of unauthorized entry, such as firewall, security protocol (SSL, PGP).
	Information Security Management			
		Risk Analysis	Risk Assessment Method	Understands baseline approach, unformal approach, detailed risk analysis, and combination of approaches etc.
			Information Resourse Investigation and	Understands evaluation method and evaluation criteria, and can investigate and evaluate an information and an intellectual property.
			Investigation of Threat and Fragile	Can carry out classification and investigation of threat, and grasp a fragile, and evaluate it. Can perform classification and investigation of threat, grasp of fragile, and evaluation.
			Risk Evaluation	Can carry out quantitive risk assessment and qualitative risk assessment
			Investigation and Arrangement of Measure System	Can carry out investigation of measures.
		Information Security Policy	Fundamental Policy	Understands items that should be described (the purpose, a scope, an organization and structure, etc.).
			Physical Measure	Understands standard related to a physical measure, standard related to a server room, standard related to workplace environment, and standard related to handling of a medium, and can create a physical measure.
			Technical Measure	Understands user authentification standard, standard related to account management, standard related to an external public presentation server, standard related to a server, standard of a client, a standard related to measure against virus, standard related to network construction, standard related to LAN, standard related to a remote access service use, standard related to a dedicated line and VPN etc., and can create a technical measure.
			Human Resourse Measure	Understands standard related to an E-mail measure, standard related to a Web Service measure, standard related to security education, and standard related to privacy, and can create a human measure.
			Operation Management Measure	Understands standard related to system maintenance, standard related to system surveillance, standard related to a gathering, and a distribution of a security information, a report corresponding to security indent and standard, an audit standard, standard related to the contract at the time of trust, enterprise generalization management, standard related to penalty regulations, renewal procedure of standard, and standard related to procedure distribution etc., and can create the measure against operation management.
		Information Security Audit	Purpose of Information Security Audit	Understands an internal audit and an external audit.
			Information Security Audit Method	Understands correction and analytical skills of an audit trail, the brittle inspection technique and an invasion test, and an audit tool, concerning the procedure of enforcement and the evaluation method of an audit
			Information Security Audit Standard anf Management Standard	Understands auditing standard related to information security and principle of a management.
			Audit Report	Understands requirements for an accountant report and can draw up an accountant report.
	Network Infra-structure Security			
		Network Design Technology	Physical Design Technology	Understands equipments and the communication route.
			Logical Design Technology	Understands division arrangement of a network, and an addressing method.
			Routing Control	Understands a static routing and a dynamic routing.
			Address Translation	Understands security countermeasures by address translation.
		Network Access Control	Packet Filtering	Understands security countermeasures by an address and a port number.
			MAC Address Filtering	Understands security countermeasures by a MAC address.
			Port Base Filtering	Understands security countermeasures by port base filtering.
			Operation and Management	Understands security countermeasures by IDS, SNMP, and a log, etc., and th
		VPN	Environment Construction	Understands arrangement, a cryptosystem system, a certification method, and access control, and can carry out an environmental construction.
			VPN Equipment Using IPSec	Understands and can apply the form of use of IPSec, certification, encryption, and a client setup.
			IPsec VPN in Router	Understands and can apply the form of use of SSL, and an encryption.

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			VPN Using SSL	Understands and apply the form of use of SSL, and an encryption.
		Wireless LAN	Authentification and Encryption	Understands and can use ESS-ID, a MAC Address, IEEE802.1x, WEP, WPA, and IEEE802.11x.
			Others	Understands and can apply network partitioning and the cooperation with an authentication server.
	Application Security			
		Electronic Mail	Threat to Mail Server	Understands the third party illegal relay, an unsolicited junk E-mail, Spam mail, a DoS attack, tapping, disclosure of a user information, a virus, and the brittleness of a typical mail server.
			Mail Server Security Measure	Understands and can apply a measure against the third party inaccurate relay, an unsolicited junk E-mail, Spam mail, a disclosure of a user information, fragile against typical mail server application, etc.
			Mail Client Security	Understands and can apply a measure against tapping.
			Mail Server Opration	Understands application of a security patch, log collection and analysis, the surveillance of a mail server and the measure against an indent, and organization, and can carry out an operation of a server.
		DNS (Domain Name System)	Threat to DNS Server	Understands disclosure of an internal network information, the attack that attached the TCP port of No. 53, the DNS cash attack, and the brittle measure against a typical DNS server.
			DNS Server Security Measure and Configuration	Understands and can use an internal network attack, the measure against zone transmission, and the measure against a DNS cash attack.
			DNS Server Operation	Understands and can carry out application of a security patch, and collection and analysis of a log, and operation of a DNS server.
		Web	Threat to Web Server	Understands attack on Web application, the DoS attack, homepage attack, the leak of an information at the time of an information transmission, and illegal use of a Proxy server.
			Web Server Security Measure	Understands and can use an introduction of an account setup, a right-to-access setup of a file/directory, user identification, a firewall/intrusion detection system, etc., etc.
			Web Server Operation	Understands and can apply upload of Web contents, application of a security patch, collection and analysis of a log, the surveillance of a Web server and the measure and organization against an indent.
			Web Server Application Design	Understands measure against cross site scripting, cookie, and session management of Web, and can use it for the design of a Web application.
			Web Browser Security	Understands threat against a wab browser and security countermeasures of a web browser.
	OS Security			
		UNIX/Linux	Log Management	Understands indent correspondence, the analysis of an access log, and storage of an access log.
			Patch Application Management	Understands a suitable patch application situation and a suitable check, and can manage the patch application.
			Service Management	Understands and can apply restriction of service, access control, demon starting at a general user and a network service and a port, and deletion of unnecessary service.
			File System Management	Understands completeness inspection of a file system, backup and recovery, an encryption file system, a default permission setup, and detection of a permission setting mistake, and can carry out management of a file system.
			Accout Management	Understands the concept of an account share, a shadow file, a strong password/ weak password, a group policy, a local security policy, and account, and distribution of authority, and can carry out a management of an account.
		Windows	Configuration, Setup Management	Understands Active Directory, a grouping policy, a security template, and analysis of an access log, storage of an access log, certificate management of an account, etc.
			Batch Application Management	Understands and can practice Service Pack, Hotfix, a patch application situation check, a package and simultaneous distribution of a patch, and WindowsUpdate.
			Audit	Can carry out audit of directory access, audit of process pursuit, audit of a service, audit of a file folder, audit of privilege use, and account audit.
			Log Management	Can carry out indent correspondence, an event log, an analysis of an access log, and storage of an access log.
			Process Management	Understands and can apply a software restriction policies.
			Service Management	Understands and can practice a network service and a port, the right to access of service, and deletion of unnecessary service.
			File System Management	Understands and can apply an encryption file, an access control file, succ
			Account Management	Understands and can manage a strong password /weak password, certificate identification, smart card identification, Active Directory, local account and domain account, and the concept of account, and distribution of authority.
			Network Protection	Understands and can apply a port filter, and restriction of a connecting agency and a connecting place, and an Internet connectivity firewall.
	Firewall			
		Firewall Introduction and Operation	Log Analysis	Understands data mining, and analysis of invasion correlation, and can make analysis of a log information.
			Difference from Invasion Detection Log	Understands difference in the character of the extracted log.
			DMZ Configuration Design	Understands and can apply division of an open segment and a secret segment, and IP routing.
			Filtering Rule Design	Understands service to permit and service to be refused, and can create a filtering rule.
		NAT (Network Address Translation)	Dynamic NAT	Understands dynamic addresstranslation of one to N (Global IP: Private IP).
		Network Access Control	Packet Filtering	Understands access control by an IP/TCP layer.
			Circuit Level Gateway	Understands access control by a transport layer.
			Application Level Gateway	Understands access control by an application layer.
			Stateful Inspection	Understands access control by an application layer.
	Invasion Detection			
		Invasion Detection System Introduction and Operation	Invasion Detection System Introduction and Operation	Understands operation organization, indent correspondence, log analysis, etc.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Invasion Detection System Functions	Invasion Detection System Function	Understands the functions of an intrusion detection system
			Detection Algorithm	Understands detection algorithm
			Detection Method	Understands detection method.
			Invasion Detection System	Understands and can use the functions of an intrusion detection system (equipment).
	Virus			
		Prevention Policy	Prevention Policy	Understands prevention policy.
		Detection, Infection, Attack	Detection, Infection, Attack	Understands structure of detection and infection and onset of a disease, and and can correspond to it. Understands detection, infection, and onset of a disease, and can perform the correspondence.
	Security Operation			
		Security Maintenance in Normal Operation	Prior Setup	Understands storing/updating setup of a log file, and a control setting tool.
			Monitoring	Can supervise an unusual account, unusual process, and system load situation, the vacant situation of a storage area, etc.
			Security Hall Measure	Understands impact evaluation of a security hole, damage evasion, patch application, etc.
			Ordinary Work	Understands data backup and restoration, account management, and password management.
			User Correspondence	Understands announcement to a user, user education, and measure against violation of a rule.
		Coping with Abnormal Occasion	Abnormality Detection	Understands and can practice IDS alarm, monitoring an information, and the judgement of an abnormal condition by an information from a user.
			Cause Investigation and Trouble Shooting	Understands and can practice unusual cause carves, analysis, and implementation of a measure.
			Urgent Correspondence	Can judge a state of emergency, and can prevent expansion of damage, and Understands a report to a related organization, and training in an emergency, and can practice them.
			Operation Related Information	Understands the type of sources and the feature of an information, and meaning and analysis of brittleness.
	Security Component Technology			
		Security Protocol	Application Layer	Understands POP, and S/MIME(Secure Multipurpose Internet Mail Extensions).
			Transport Layer	Understands SSL/TLS.
			Network Layer	Understands IPSec and IpinIP.
			Datalink Layer	Understands L2TP, PPTP, L2F, MPL, and MPOA.
		Authentication	Password Authentification	Understands a fixed password, a one-time password, password encryption, etc.
			Biometric Authentification	Understands biometrics authentification.
			Authentification Device	Understands equipments for authentification.
			Authentification Protocol	Understands authentication protocol..
			Web Authentication	Understands cookie and SSL.
			System Authentication	Understands authentification between servers.
			Single Sign-on	Understands structure of a single sign-on.
		PKI (Public Key Infrastructure)	PKI Use	Understands a secfure time stump, authentication, electronic CP, a permission organization, integration with authority management and PKI, and the standardization of the usage.
			Certificate and Certification	Understands structure and meaning of a certificate, validity verification of a certificate, format of a certificate, etc.
			Certificate Lapse	Understands a certificate lapse list and a certifying authority lapse list, etc.
			Reliability Model	Understands a layered structure of a certification authority, and mutual certification, etc.
			Contract Model	Understands a closed model, a network model, and an open model.
			Description and Data System	Understands description and a data system.
			Standard	Understands standard related to a public key certificate etc.
			Open Repository	Understands use of a directory server.
			Certification and Operation of Certificate Authority.	Understands certificate authority.
			Legal Framework	Understands digital signature and certification method.
			PKI Use Component Technology	Understands component technology related to PKI.
			PKI Supply Service	Understands certification, safety of data, and privacy of data.
		Encryption	Open Key Encryption	Understands principle, a realizable function and algorithm concerning with a public key cryptosystem
			Common Key Encryption	Understands principle and the algorithm concerning with a common key encryptosystem
			Hush Function	Understands the principle and construction about a hash function, and an exclusive hash function.
			Random Number for Encription	nderstands the principle of a random number for encription. Understands intrinsic random number and pseudo random number.
			Key Management	Understands the system of key management.
			Zero Knowledge Proof	Understands the principle of zero knowledge, a proof protocol, and its application.
			Other Encryption System	Understands other encryption system
			Decryption and Cipher Evaluation	Understands decryption and cipher evaluation.
		Electronic Signature	Electronic Signature Use	Understands code signing and an XML signature.
			Electronic Signature Component Technology	Understands algorithm used for electronic signature, and the Hash function used.
			Electronic Signature Framework	Understands signature creation method, verification method, etc.
			Advantage of Electronic Signature	Understands guarantee of of being the person himself/herself by use of a private key, use of a Hash function, and the ease of a signature verification.
	Unauthorized Access and Prevention			
		Unauthorized Access	Remote Unauthorized Entry and Operation	Understands remote unauthorized entry and operation.
			Stop of Service.	Understands stop of service.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			Tapping Act	Understands a tapping act.
			Reconnaissance Act	Understands a reconnaissance act.
			Information Gathering	Understands an information gathering of unauthorized access.
		Prevention of Illegality	Illegal Copy Prevention	Understands illegal copy prevention.
			Electronic Watermark	Understands an electronic watermark.
	Statute and Standard			
		Standards, Guidelines	Standards, Guidelines	Understands various standards, the indicator, and the guideline, such as an information system safety measures standard, computer virus measure standard, computer unlawful access measure standard.
		Statute	Statute about Information Protection and Illegal Access Prevention	Understands the act for protection of computer-processed personal data, digital signature and certification law and unlawful access preventive measures.
			Criminal Code, Criminal Procedure Code, Copyright Act, and Patent Law	Understands criminal code, criminal procedure code, copyright act, and patent law
		International Standards	ISO Standard, IEEE Standard	Understands the ISO related standards, the IEEE related standards, etc.
		International Guidelines	OECD Related Guideline	Understands the OECD related guideline etc.
		Information Security Regulations	ISMP, P Mark, Information Security Audit System	Understands ISMP, P mark, and the information security audit system.

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Program Develpment				
	Program Design			
		Program Design Principle	Selection of Module Division Method	Understands and can apply the division technique that pays its attention to data flow (STS decomposition method, a transaction decomposition method, the common function dividing method) , and the division technique that paid its attention to the data structure.
			Module Division Principle	Understands and can apply a modular size, modular intensity, the modular degree of combination, the control range, and the influence range.
			Resuse of Pattern and Parts	Understands and can apply extraction of a processing pattern and parts, the review of a processing pattern and a part list, the rate of use of a processing pattern and parts, and standardization of a processing pattern and parts.
		Program Design Documentation	Creation of Program Design Document Principle	Can create a standard related to a descriptive content, the change in standard at the time of maintenance and an improvement, and the descriptive content of a user manual.
			Processing Outline Description	Can describe details of contents of processing (processing logic).
			Database Detail Design	Understands clarification of database input/output condition (a deadlock, a rollback number) and SQL, and tcan describe details of a database.
			Standard Related to Interface Among Modules	Understands interface conditions in an own program, program interface conditions among programs, and a reusable program interface, and can create and use a standard.
			Development Environment	Understands program development environment and can create the interface of a related module.
		Creation of Module Specification and Test Specification	Module Specification Creation	Understands a procedure, a method, and the main point, and can create a detail specification of a modular.
			Test Specification Creation	Understands the type and purpose of a test, the important matter on a test case design, and the test method, and can draw up test specifications.
		Design Review	Program Design Document Review	Can review a program design document.
			Test Specification Review	Can oerform a test specification review
			User Manual Review	Can review a user manual.
	Programming			
		Algorithm Fundamentals	Flow Chart	Understands and can apply how to write a flow chart and the main flowchart symbols.
			Basic Algorithm	Understands and can apply how to calculate the sum total and an average, how to calculate maximum/minimum, the view of a stack, and the view of a prime number.
			Search	Understands and can apply a sequebtial search, a secondary search, etc.
			Alignment	Understands and can apply a transform method, a choosing method, an inserting method, etc.
			Character String Processing	Understands and can apply processing of a character string.
			Office Work Use	Understands a control break, merging of a file, collation, and updating.
			Data Structure	Understands and can apply data structures, such as array, a list, a tree structure, and a hash table.
		C Language (Basic)	Basic Operation	Understands and can apply outline of C language (a concept and the feature), and an easy programming (the form of a program, a variable, a type, a constant, an order structure program), preprocessor processing (a macro function (#define, etc.), execution of a program (execution from coding of a program to execution in a console (or compound environment).
			Program Control	Understands and can apply a selection structure program (program creation using a selection structure program), a repetition structure program (program creation using a repetition structure program), an array, and a character string (treatment of the character string data using a character array).
			Function (Basic)	Understands and can apply the foundations of use of a function (underatand the definition of a function and can use a call), a variable setup (the domain and useful range of a variable), and a library function (mathematical function).
			Pointer and Memory Control (Basic)	Understands and can apply the foundations of an address and a pointer (concept of an address and a pointer), memory reservation (dynamic reservation and release of a memory), pointer operation (operation of the array using a pointer), and address delivery (address delivery in a function).
		C Language (Intermediate)	Function	Understands and can apply details of use of a function (Understands the definition of a function and execute a call), a variable setup (the domain and useful range of a variable), and a library function (mathematical function).
			Pointer and Memory Control	Understands and can apply details of an address and a pointer (concept of an address and a pointer), memory reservation (dynamic reservation and release of a memory), pointer operation (operation of the array using a pointer), and address delivery (address delivery in a function).
			Structure	Understands and can apply the definition of outline of a structure (the foundation and the outline of a structure in the C language), and the definition of a structure, and programming of a structure.
			Input and Output	Understands and can apply a file (use of a file), and input and output (input and output of a general file and those using an input/output function).
		C++ Basic	C++ Fundamentals	Understands and can apply outline of C++ (design concept of C++), the functioC++, (formation of C++ programming, a variable, a type), and the design technique of C++ (an object oriented analysis/design, an object oriented programming outline).

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			Function	Understands and can apply use of a function (the definition of a function and use of a call), a variable setup (the domain and useful range of a variable), and a library function (programming using library function).
			Pointer and Memory Control (Basic)	Understands and can apply the fundamentals such as an address and a pointer (concept of an address and a pointer), memory reservation (dynamic reservation and release of a memory), a pointer operation (operation of the array using a pointer), and an address delivery (address delivery in a function).
			Structure and Class (Basic)	Understands and can apply the fundamentals such as the type of a structure, the fundamentals of a class (definition of a class, definition of a member, definition of a method, and capselization), and the programming of a structure and a class.
		C++　Intermediate	Pointer and Memory Control	Understands and can apply details of an address and a pointer (concept of an address and a pointer), memory reservation (dynamic reservation and release of a memory), pointer operation (operation of the array using a pointer), and address delivery (address delivery in a function).
			Structure and Class	Understands and can apply details such as the type of a structure, the fundamentals of a class (definition of a class, definition of a member, definition of a method, and capselization), and the programming of a structure and a class.
			Input and Output	Understands and can apply a file, input and output, and a stream (understanding and execution of input/output form of a streaming).
			Operator	Understands and can apply an operator (a definition and use of a operator), and the overload.
			Object-oriented	Understands and can apply outline of object-oriented (object oriented programming, practical use of an attribute and a method), a class (a class, and a member, a friend function and succession of a class), and a class object (a constructor and a destructor).
		Java (Basic)	Grammar	Understands and can apply the basic structure of a program (the basic structure of a program, the class, and method), a control statement (the foundation of a control statement, operator), and the use of a class.
			Application	Understands and can apply character string operation (input and output of a character string, use of a StringBuffer class), use of Collection, exception handling, thread control (thread processing), and JDBC (application creation to access a database).
			GUI (Basic)	Understands and can apply foundations of event processing /AWT, /Swing, and Applet.
		Intermediate	GUI	Understands and can apply details of event processing/AWT, /Swing, and Applet.
			Web Application	Understands and can apply Web application (composition file of Web application), a servlet (program development using a servlet), session management (Web application creation accompanied by session management), and /JSP (Web application development using JSP), and /Java Beans (program development using Java Beans).
			J2EE Outline	Understands and can apply J2EE outline, technical selection, session management, requirements for a system, and systems development.
			Object-oriented	Understands and can apply outline of an object-oriented programming, an object, and inheritance.
		Visual Basic Basic		Understands and can apply outline of VB, a class and an object, the programming foundation, and a creation of procedure, and use of an intrinsic function.
			GUI (Basic)	Understands and can apply the fundamentals such as a form, a form and control, an ActiveX control, and the distribution of application, and the use of a debugging function.
		Visual Basic Intermediate	GUI	Understands and can apply details of a form, form and control, an ActiveX control, and distribution of application, and use of a debugging function.
			Web Application	Understands and can apply the creation of Web application using .NET.
		Visual C++ (Basic)	Outline	Understands and can apply outline of VC++.
			Fundamental Operation	Can create an easy programming, and can compile and execute it.
		Visual C++ (Intermediate)	Application	Can create GUI application using VC++.
		Assembler (Basic)	Fundamental Specifications	Understands outline of an assembler and can carry out processing of a character string, operation using a numerical value, the input/output processing, condition judgment, and repetition processing.
		Assembler (Intermediate)	Application	Can develop a program using an assembler.
		COBOL (Biasic)	Fundamental Specification	Understands and can apply basic specification, program development using COBOL (the assembly of program logic, a condition judgment and input/output, list output, etc.).
		COBOL (Intermediate)	Program Development	Can develop an application program using COBOL (business system).
	Script Language			
		VB Script	Outline of VBScript	Understands a variable, an array, a control syntax and can create a script program using these.
			Function	Can create a program using a function.
			Error Processing	Can create the script program that mounted error handling.
		Java Script	Outline	Understands a variable, an array, a control syntax and can create the script program using these.
			Function	Can create the program using a function.
			Error Processing	Can create the script program that mounted error handling.
		Perl	Perl Outline	Understands Perl as a programming language, text processing and a operator, control syntax, and file input and output.
			CGI Script	Understands basic of CGI script and basic knowkedge to operate using CGI.
			Object Oriented	Understands basic of object-oriented programming.
			Web Application	Can create Web application (CGI script) using Perl.
		Ruby	Outline of Ruby	Understands outline of features of Ruby, execution environment of Ruby, and execution of program etc.
			Basic Ruby Ggammar	Understands basis of basic data, variables and multiplier, and control syntax, etc.
			Object Oriented	Understands basic of object-oriented programming.
			Web Application	Can create and execute Web application program using Ruby.
		PHP	PHP Outline	Understands regular expression. Understands HTTP and can use PHP.
			Web Application	Can create Web application (CGI script) using PHP.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
	Special Perpose Language			
		MATLAB	MATLAB Outline	Can execute a numerical computation using MATLAB. Can make a simple programming by MATLAB.
			MATLAB Application	Can create a complicated program and GUI using MATLAB.
	Mark-up Language			
		HTML	Web Framework	Understands software composition, a hypertext, and structure of URL and FTP.
			HTML Description	Can describe a document structure, a title, a paragraph, a list, a font, a picture, and a table.
			Page Structure	Understands and can apply an anchor, a frame, an image map, and a link.
		XML	Outline	Understands the feature and history of XML, and difference with SGML/HTML.
			Application Domain	Understands an application domain of XML.
			Related Component Technologies	Understands and can apply component related technology of XML (programming, a schema definition, style specification, a link, etc.).
			Related Tool	Understands and can apply a related tool (a purser, an editor, a database).
			Document Creation Premise	Understands and can apply extended BNF form, unicode and a coding system, substance, and a well-formed and appropriate document.
			Well-formed Document	Understands and can apply XML declaration, a comment, PI, an element, an attribute, a reference, and a CDATA section.
			Appropriate Document	Understands and can apply document type declaration, markup declaration, parameter substance, and a conditional section.
			Name Space	Understands and can apply outline of name space.
		XSLT	XML Document Style Specification	Understands and can apply style specification technology of an XML document, what is XSLT, relation with other technology, relation an XML document and a style sheet.
			Document Conversion	Can carry out conversion to a text, and HTML and XML. Can describe XSLT.
			Xpath Function	Understands and can apply what is Xpath, xLink, and XPoiter, a location path, a node test, an axis, and a function.
			XSLT Style Sheet Creation	Understands and can apply a XSLT processor, a template rule, control structure, and a special function.
	Program Test			
		Test Method	Test Planning	Understands the content of the test planning and can make the test plan.
			White Box Test	Understands test methods of statement coverage and branch coverage and full branch coverage.
			Black Box Test	Understands test methods of equivalence partition, limit value analysis, and cause/effect graph and error estimation.
			Test Design	Understands the white box test and the black box test, and can undertake the test design.
			Test Execution and Test Management	Can undertake the progress management of the test, and can undertake the problem management and its progress management.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
System Development				
	System Development Method			
		Process Model	Process Model Understanding	Understands and can select a process model.
			Water Flow Model	Understands a water fall model.
			Growing-up (Spiral) Model	Understands a grown-up type process model. Understands a spiral model.
			Prototype Model	Understands a prototype model.
		Components and Reuse Technique	Components and Reuse	Understands and can practice formalizing of software parts, and the reuse.
			Software Package Use	Understands and can practice a subprogram library and a class library.
		Life Cycle	Process	Understands software life cycle.
		Business Package Specific Development	Business Package Specific Development	Understands and can apply development technique peculiar to each business pkg.
			General Technique	Understands and can apply Fit&Gap analysis, a To-Be model, etc.
	Project Management			
		Scope Estimation	Experiential Estimating Method	Understands and can apply an experiential estimating method.
			ILmit Value Method	Understands and can apply a limit value method.
			Function Estimating Method	Understands and can apply a function estimating method.
			Feature Pointing Method	Understands and can apply a feature pointing method.
			Object Pointing Method	Understands and can apply a object pointing method.
		Process Estimation	Similar Estimating Method	Understands and can apply similar estimating methods.
			PUTNAM	Understands and can apply PUTNAM
			COCOMO	Understands and can apply COCOMO
			COCOMO	Understands and can apply COCOMO .
			Application Assembly Method	Understands and can apply an application assembly method .
		Process Management	Schedule Management	Can carry out a schedule management.
			Cost Management	Can carry out a cost management.
			Resource Management	Can carry out a resource management.
		Quality Management	ISO9000 Series	Understands and can practice ISO 9000 series.
			CMM	Understands and can practice CMM(software development process maturity).
	Design Method			
		Object-Oriented Design	Object-Oriented Outline	Understands a class and an instance, an encapsulation and an information hiding, and the division by class, the layered structure and the inheritage, concerning the object-oriented concept.
			Object-Oriented Analysis	Understands UML (a youth case figure, a class figure, an interaction figure and the State chart figure, an activity figure), and can make an object oriented analysis.
			Object-Oriented Relation (UML)	Understands relation between an object figure and a class figure and can explain the difference.
			Object Interaction (UML)	Understands an interaction figure and a communication figure.
			State Transfer and Event (UML)	Can express a change state using a state chart diagram.
			Diagram (UML)	Understands purpose and outline of a use case diagram, as well as other diagrams.
		Structured Design	Structured Design Outline	Understands the concept of a structured design.
			Structured Analysis	Understands DFD and a data dictionary. Can draw up Mini specifications.
			Structured Design	Understands and can design division technique that paid its attention to data flow(STS, TR), division technique that paid its attention to the data structure (Jackson, Warnier) , and independency of a module about a structured design (intensity and the degree of combination).
		Data-Oriented Design	Data-Oriented Design Outline	Understands the concept of DOA (Data Oriented Approach).
			Data-Oriented Analysis	Understands an entity, an attribute, and a ralationship, and can analyse it using these.
			ERD(Entity Relationship Diagram)	Understands and can describe ERD (Entity Relationship Diagram).
	Requirement Definition			
		Requirement Definition Documentation	Requirement Definition Documentation	Can create a requirement definition document.
		Customer Requirements Analysis	Present Data Analysis	Can grasp environment (outside and inside). Can arrange a restrictions matter.
			Problem/Subject Clarification	Can examine structure of a problem. Can grasp and evaluate a cause.
			Examination of Object Domain	Can perform clarification for development (scope).
			Systemization Goal Setup	Can set up SLA.
			Business Use Term Arrangement	Can perform an inquiry of a business term, the meaning of a term/the definition of the contents, and the standardization of a name.
			Business Requirement	Can create a business flow. Can make an arrangement of a work content (operation specifications).
	External Design			
		External Specification Design	User Interface Design	Can create a screen global image, the design of a screen flow, a screen layout design, and create an output image and output specification.
			Subsystem Dsign	Can divide a system into the unit of a subsystem and carry out the subdivision of the function of a subsystem.
			Logical Data design	Can design and describe logical data structure. Can make an inquiry of a data item, analysis of the relevance of data, a file the determination of candidates of a file, and matching with the data item in a file candidate and a function.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			Network Design	Can design a connection method of a computer or a terminal.
			Operation Design	Can make an inquiry of the matter concerning with an employment function and determination of an operation flow (operation flow chart).
			Environment Design	Can examine a hardware composition, a network composition, and a software composition concerning an environmental design.
			Test Design	Can clarify the range for a test. Can clarify the type/enforcement organization of a test. Can set up the completion standard of a test.
			Shift Planning	Can determine a shift system (parallel, gradual, a package). Can determine shift organization and prepare a schedule.
		External Design Documentation	External Design Document Creation	Can create an external design document.
	Internal Design			
		Internal Specification Design	Module Design	Can design a module configuration figure and the processing procedure of each modul.
			Physical Data Design	Can design and describe a physical data structure. Can describe the delivery method of the form of an internal data between modules.
			Communication Protocol Design	Can design an actual protocol in connection of a computer and a terminal.
			Table Design	Can design a table of a database and can normalize data.
		Internal Design Documentation	Internal Design Document	Can create an internal design document.
	Test Method			
		Test Method	Unit Test	Understands a test method for a module.
			White Box Test	Understands a test method of command complete coverage and judgment condition complete coverage and two or more article affair complete coverage.
			Black Box Test	Understands a test method of equivalent division, limit value analysis and graph of cause and rssult, and an error guess.
			Unified Test	Understands test methods, such as a top-down test/bottomup test, a stub/driver.
			Operation Test	Understands a test method carrying out in the same manner as the time of real operation.
			Error Embedded Method	Understands the error embedding method.
	Review Method			
		Review Method	Peer Review	Understands and can practice a peer review
			Joint Review	Understands and can practice a joint review
			Walk Through	Understands and can practice a walk through.
			Prototyping and Trial	Can carry out prototyping and trial.
	Standardization			
		Development Standards	Standardization	Understands object and purpose of standardization, and can practice standardization.
			Development Standard	Understands a typical development process and can practice standardization related to development.
			Document Standard	Understands a typical document, a code design, and a term definition, and can practice standardization related to document.
			Term Standard	Understands a term definition and can practice terminological standardization.
		International Standard	Process Standardization of Development and Dealings	Understands ISO 9001, process standardization related to development and dealings of SLCP-JCF98, etc., and can practice standardization.
			Standardization of Information System Bases	Understands standardization related to an information system bases, such as OSI, IEEE, and OMG, and can practice standardization.
			Data Standardization	Understands data standardization related to a character code, a bar code, etc., and can practice standardization related to a data.
	Open Source Software (OSS)			Understands that the open source software becomes important for the construction of the computer system (system development and program development) in a present information technology society, and understands the outline and a concrete view of it in the real use and the future direction.
		Development Technology of OSS	Background and Features of OSS	Understands the philosophy, details, a background, the transition of a commercial culture, the definitions, features, and etc. of the open source software.
			Development Methodology of OSS and Business Model	Understands the development and roles of communities for the spread promotion, and the activities, etc. of OSS, and understands the development technique and the business model of OSS.
			Kinds of OSS	Understands the examples of various servers and kinds of softwares according tousage in the open source software, and the virtualization of the open source software.
			Software Development Tool of OSS	Understands the language for the development of OSS, and the gramework for development of OSS, and the integrated development environment to develop the open source software.
			Desktop Application of OSS	Understands an outline of the desktop application by OSS and the concrete examples of the integrated desktop environments and the desktop applications (an office suite, a browser, a meter, and a graphic tool).
			Server Application of OSS	Understands the outline of OSS in the business system. Understands the outline of OSS for the customer relations management (CRM), the business iintelligence data analysis (BI), the enterprise, management resource planning (ERP), the content management system (CMS) for the Web site.
		Use of OSS	OSS and Commercial Business	Understands the business model of OSS, and the development of the OSS business on a commercial base.
			Use of OSS	Understands the case of the system that is constructed by use of OSS and is in operation, and understands the points on how to use OSS and system construction, the advantage, the disadvantage, and notes to be cared.
			Promotion of OSS	Understands the promotion activity of OSS in domestic and overseas.
		OSS License	Outline of Open Source Software License	Understands the meaning of the open source software license, kinds and features of OSS license, the use condition, and the copyright, etc.
			GPL Type License	Understands the feature and the use condition of the GPL type license, and the copyright, etc.
			MPL Type License	Understands the feature and the use condition of the MPL type license, and the copyright, etc.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			BSD Type License	Understands the feature and the use condition of the BSD type license, and the copyright, etc.
			Distribution of License and Risk Management	Understands the spread and the risk management of OSS license.
	Intellecture Property Right of Software			Understands that the software is an intellectual product, and the right that the producer owns is legally protected. Understands the protected content, the legal grounds and the risk management etc. of the software intellectual property right concerning the intellectual property right of the software.
		Fundamentals of Software Intellectual Property Right	Patent	Understands the content protected by the patent of software, and understands the basis of the procedure etc. of the application for the patent and the acquisition of the patent etc.
			Trademark Right	Understands the brand name of the computer program that can be registered as a trademark, understands the basis of the registration of the
			Copyright	Understands the object of the copyright, the effect of the copyright, and the protection concerning software, and understands the basis of the procedure of the copyright registration.
			Other Intellectual Property Right	Understands the bases of intellectual property rights of the utility model and the design, etc.
			Problem over Intellectual Property Right	Understands the dispute case over the literary property of software, and understands the importance of the risk management of the software intellectual property right.
			Intellectual Property Management Business	Understands the importance of the contents business of the lintellectual property.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
System Development (Multimedia)				
	CG Creation			
		Image Capturing and Editing	Photography	Understands expression by photography and lighting.
			Moving Picture Taking	Understands the type and technique of an image, and camera work.
			Image Editing	Has the basic knowledge of an image edit, and understands an actual editing, and the edit system and the edit method.
		Modeling Basics	Fundamental Knowledge of Modeling	Understands the foundation of modeling (a coordinate system, grouping and a layered structure, a modeling element, etc.).
			Modeling in Reality	Understands procedure, style, notes, and fundamental modeling techniques at the time of modeling work.
			Material Expression Fundamentals	Understands the foundation of material expression (structure, a fundamental parameter, mapping, color application method, etc.).
		Animation Technique	Animation Technique	Understands the fundamental technique of CG animation, and the various techniques that change with objects of animation.
			Character Animation	Understands the technique of cartoon and moving a character with stylish going.
			Facial Animation	Understands a facial expression and lip sync.
		Scene Construction	Scene layout	Understands a layout of a scene.
			Lighting	Understands characteristic and the type of light that can be used by CG.
			Rendering	Understands technique and the type of a shading algorithm and a rendering algorithm, and the HDRI rendering.
			Synthesis	Understands the expressive and technical reason why synthetic processing is needed, technique of synthetic processing, creation method of a synthetic material, and notes at the time of composition.
		Mathematical Modeling	Mathematical Modeling	Understands difference between CG and image processing, and view of the modeling technique by logical description.
			Modeling Technique	Understands a modeling technique under a form and a rule, and a procedural modeling technique.
			Motion and Change	Understands a motion and change in an animation.
		Intellectual Property Rights	Intellectual Property Outline	Understands intellectual property rights and copyright.
	Web Design			
		Concept Making	Information and Communication	Understands and can apply knowledge about the role of a designer in connection with Web and its work, and can carry out the process of work.
			Concept Setup	Understands knowledge about the process of concept making and the concrete technique, and can carry out the application.
		Web Site Implementation Technology	Web Site Implementation Technology	Understands the fundamental system configuration for realizing a Web site, program language, software, etc.
		Information Structure	Information Collection and Classification	Understands collection of an information, and the scheduling technique for a classification, and the technique for collection/classification of an information.
			Information Organization	Understands the technique of systematizing an information, and the labeling technique for making a user grasp the image of an information quickly.
			Construction of Web Site Structure	Understands the construction technique of website structure. Understands the creation technique of making the user who becomes a target lead to the target information.
		Page Design	Layout	Understands the fundamental matter about a layout of a Web page.
			Typography	Understands structure of a character and a font, and design using the structure of a character.
			Graphics	Understands a layout method and notes when using graphics by a Web page.
			Color Cordinate	Understands structure of color expression of computer and a color, and view of a color planning.
		Expression Technique of Image Movement and Sound	Movement Technique and Expression	Understands technique and expression of a motion in a Web page.
			Notes on Move Introduction	Understands typical notes introducing a motion into a Web page.
			Sound Performance	Understands production of a sound in a website.
		Interface	Interface	Understands interface in a common tool and equipments.
			User Interface	Understands image of user interface as an ideal, and user interface as Web contents.
			Navigation	Understands mounting of the navigation function in a website production.
			Navigation Design Technique	Understands the technique of a navigation design.
		Test and Evaluation	Web Site Test	Understands the time when a website should be tested, and a required test item
			Access Log Analysis	Understands the analysis technique of an access log used as the important indicator of operation of a website, or renewal.
			Web Site Evaluation	Understands evaluation of quality of a website and the evaluation technique.
			Web Site Operation and Renewal	Understands the method of operation and updating of a website. Understands the renewal technique of a website, and SEO that should be set up at the time of renewal of a website.
	Image Processing Engineering			
		Digital Image Fundamentals	Image Processing syatem Configuration	Understands outline of a flow of input, processing and output of an image.
			Image Digitalization	Understands sampling and quantization of a picture, the Nyquist interval, and aliasing based on a frequency.
			Brightness/Contrast Conversion	Understands conversion of the brightness or contrast by various types of tone curves.
			Limited Color Display and Half Toning	Understands limited color display and pseudo gradation display.
			Special Effect	Understands special effects, such as reversal of a shade, posterization, and solarization.
			Geometric Model of Image Generation	Understands a pinhole camera model, a fluoroscopy projection model, and a lens model.
			Image Generation of Optical Model	Understands what type of phenomenon has occurred, when light strikes upon an object, observes the reflection and perceives or photos color.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			Color and Expression System	Understands mixed colors, a color system, and conversion of a color system etc.
			Quantity Expressing Image Characteristics	Understands objective statistics value and subjective quantity expressing features of a picture.
			Photoing Parameter	Understands what type of adjustment can be carried out, when photoing a picture with a camera. Understands the method of adjusting various types of parameters with sufficient balance, when photoing the picture according to the purpose.
		Image Filtering and Restoration	Spacial Filtering	Understands various processings by local neighboring operation, relations with two-dimensional convolution, a linear system, and spatial frequency.
			Fourier Transform of Image	Understands the method of calculating spatial frequency and the Fourier transform
			Linear Filter	Understands various kernels, such as smoothing, radicalization and edge extraction,n, and can choose it according to the purpose.
			Nonlinear Filter	Understans the type, character and the flow of processing of a nonlinear filter.
			Image Restoration	Understands a restoration technique of a blurred image, and an image reconstruction technique from projection.
		Geometric Transformation	Coordinate Transformation	Understands that an image is geometrically transformable with coordinate conversion. Understands expansion and reduction of an image, rotation, mirror image conversion, skew conversion, and the affine transformation that combined parallel translation.
			Homogeneous Coordinate and Affine Transformation /Projective Transformation	Understands formula and effect of transformation that carries out parallel movement, and the affine transformation of an image.
			Resampling and Onterpolation of Image	Understands the necessity for interpolation for geometric transformation of an image. Understands the nearest neighbour and thr bilinear interpolation.
			Image Mosaicing	Understands an image mosaicing method including color correction etc.
		Detection and Recognition of Domain, Pattern, Figure	Image Domain Partitioning	Understands purpose and concept that are divided into a domain from a multi-valued image. Understands the concrete algorithm of the domain partitioning method.
			Pattern Detection	Understands similarity and difference used for the principle of template matching or template matching, and the estimation of subpixel position, etc.
			Feature Point Detection	Understands corner detection and edge detection.
			Figure Component Detection	Understands the technique of detecting the fundamental components, such as a straight line.
			Pattern Recognition in Image Processing	Understands flow of the fundamental processing, the principle, and the method related to the pattern recognition using an image.
			Binary Quantization	Understands various techniques and features for converting a picture into binary values.
			Basic Processing and Measurement of Binary Image	Understands various processings and measurement to a binary image.
		Moving Image Processing and Spacial Information Processing	Moving Object Detection Using Differential Image	Understands the statistical background subtraction method that improved the principle detecting a moving object by background subtraction or the subtraction between frames.
			Moving Object Detection Using Optical Flow	Understands the moving object detection using the optical flow by a block matching gradient method.
			Geometric Relationship between Image and Space	Understands relation between the coordinates in space and image coordinates, and the method of expressing fluoroscopy projection with homogenous coordinate, the method of a camera calibration, and the parameter called for by it. Understands epipolar geometry.
			Three Dimentional Restoration from Image	Understands principle of three-dimensional restoration and principle of an active stereo using an information, including the shading, a texture, defocusing, etc. Understands principle of the three-dimensional assumption technique from multiple images, such as a parallel stereo and illumination difference stereo and structural estimation from a motion.
			Spectrum Information Analysis	Understands estimation of a light source or spectrum reflectance, the separation technique of a reflective ingredient in which the dichroic reflective model is used, etc.
		Image Compression and Coding	Image and Code	Understands principle and the type of basic coding, in considering a picture as a code, such as entropy coding that understands the amount of data andoccurence probability.
			Still Image Coding	Understands the fundamental concept of image compression technology, such as JPEG
			Binary Image Coding	Understands run length coding and chain coding, and a differential chain coding, typical as a coding system of a binary image.
			Moving Image Coding	Understands the fundamental concept of video compression technology, such as MPEG.
			Electronic Watermark	Understands purpose and the type of digital watermarking, and the purpose and technique of a visible watermark and an invisible watermark.
		Image Processing Application System and Standard	Hardware and Peripheral Equipment	Understands fundamental structure about the various hardwares relevant to an image.
			Standard	Understands an image format and a picture coding format.
	CG Engineering			
		Visual Information Processing Fundamentals	CG anf Image Processing	Understand the purpose of CG and each image processing, and has basic knowledge about the technology used there.
		Coordinate Transformation	Two Dimentional Coordinate System anf Transformation	Understands a two-dimensional coordinate system and the geometric transformation on it.
			Three Dimentional Coordinate System anf Transformation	Understands a three-dimensional coordinate system and the geometric transformation on it.
			Projection	Understands a projection to the two-dimensional figure of three-dimensional data.
			Viewing Pipeline	Understands a series of processes until it displays three-dimensional image form data.
		Modeling Technology	Figure Modeling	Understands various methods of expressing polyhedron form, and grasp each feature.
			Figure Representation of Solid Model	Understands CSG expression, a boundary representation, and sweep expression as an typical representative of a solid model.
			Local Conversion of Boundary Representation	Understands preservation of a boundary representation, and local transformation operation.
			Curve and Curved Surface	Understands the technique of expressing a curve/curved surface using mathematical formula.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			Polygon Curved Surface Representation	Understands expression of the curved surface by a polygon.
			Other Curved Figure Representation Method	Understands expression of complicated form
		Rendering	Realistic Representation Method	Understands a realistic expression and algorithm
			Hidden Surface Removal	Understands each hidden surface removal algorithm, such as the depth sorting method, a scanline algorithm, and a Z buffering algorithm
			Ray Tracing Method	Understands the ray tracing method.
			Shading	Understands various shading models according to the type and its characteristic of the light source, and the reflective characteristic.
			Shadowing	Understands a concrete calculation algorithm of shadow attachment (shadowing).
			Global Lighting Model	Understands the typical radio city method and the photon map method in a large region lighting model.
			Mapping	Understands the mapping technique that attaches a pattern and unevenness on the surface of an object.
		Animation Technology	CG Animation Fundamentals	Understands the basic principle of an animation.
			Animation by Camera Control	Understands a camera control by setup of camera position and an angle.
			Key Frame Animation Representation Method	Understands the foundation and technique of key frame animation.
			Special Effect Animation	Understands optical special effects and the method of expression of the motion by change of a form
			Procedure-type Animation	Understands the procedural animation that simulates a physical rule and generates a motion.
			Character Animation	Understands the technique of designing a motion of a character.
			Real Time Animation	Understands the technology of real time animation.
			Synthesis with Real Image	Understands the technology of an on-the-spot photo image.
		Image Processing	Digitl Image and Representation	Understands the fundamental matter of digital imaging.
			Drawing and Generation of Two-dimensional Image	Understands the technique of drawing and generating a two-dimensional image from the three-dimensional scene.
			Pixel Shade Conversion and Color Conversion	Understands conversion of brightness, contrast, and a color space.
			Spacial Filtering	Understands the purpose and technique about the spatial filtering of a picture. .
			Image Geometric Transformation	Understands geometric conversion of a picture.
		Advanced CG Representation	Image-based Rendering	Understands algorithm of a typical image based rendering.
			Non-Photrealistic Rendering	Understands the type and outline of a method of a non photograph realistic rendering.
			Visualisation	Understands visualization that displays data using CG.
		CG Systems	CG System	Understands component equipments and outline of CG system
			CG Software	Understands software needed by CG system.
			Realtime Three-Dimentional CG System	Understands parallel processing technology for high speed processing, and the processing system of realtime three dimentional CG.
			Three-Dimentional Data Input Device	Understands the method of obtaining input data based on what kinds of principles a three dimensional data input unit obtains input.
			Three-Dimentional Display	Understands the three dimensional display that presents three dimensional information from two dimensional image information.
	Audio Engineering			
		Acoustics Basics	Fundamental Principles of Sounds	Understands the fundamental character of a sound wave. Understands thefundamental frequency and the loudness of a sound.
			Room Acoustics	Understands reflection of sound and reverberation. Understands the impulse response.
			Hearing	Understands the structure of hearing.
			Speech	Understands the structure of utterance. Understands the feature of a speech.
			Analog Audio Equipment	Understands the structure of a microphone. Understands the structure of a speaker. Understands audio peripheral equipment.
			Digital Audio Equipment	Understands various digital conversion systems. Understands about digital audio equipment, such as CD and MD.
		Audio Signal Processing	Audio Analysis	Understands the spectrogram. Understands the Fourier transform
			Noise Removal and Reverberation Removal	Understands the technique of spectrum subtraction. Understands the adaptation filter. Understands the technique of active noise control.
			Room Acoustics	Understands a digital surrounding and a binaural.
			Microphone Array	Understands a delay sum array and a subtraction type array.
			Audio and Speech Coding	Understands the fundamental technique of an information coding, such as entropy coding and quantization. Understands audio coding systems, such as an MPEG audio, ATRACK, TwinVQ. Understands speech coding systems, such as CELP.
	Audio Design			
		Sound Design	Max/MSP	Can make an easy programming using Max. Can carry out audio signal processing of an easy effector using Max/MSP.
			Effecter	Understands effect and structure that are typical effectors, such as a filter, delay, reverbration, a flanger, and a chorus.
			MIDI	Understands the MIDI standard.
			Synthesizer	Understands analog synthesizer and the digital synthesizer. Understands addition composition and an FM sound source. Understands the sampling and the PCM tone generator. Understands the effector. Understands a controller and MIDI.
		Sound Recording	Digital Audio Coding	Understands constituent components of digital recording system. Understands hardware recorder, and the software recorder. Understands the various formats used by digital recording. Understands synchronization of the equipment in word clock, and a time code. Understands digital mixing.
			PA Fundamentals	Understands work contents of PA. Understands a sound required for PA. Understands equipments required for PA.
			Digital Sound Editing	Understands editing, processing, effect, format conversion of a recorded sound, and CD creation.
		Music Theory	Music Fundamentals	Understands a clef, pitch name, a note, and rhythm
			Tonality, Pitch, Scale	Understands tonality, such as a pitch, a scale..
			Harmonics	Understands the fundamentals of harmonics.
			Sound Temperament	Understands pure temperament, equal temperament, the Pythagoras temperment, etc.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
Project Management				
	Project Management Basics			
		Elementary Project Management	Project Management anf Its Framework	Understands outlines, such as the meaning of a project, necessity, an outline of management, a process group of process management, a success factor, a development phase and a process of software.
			PMBOK Process	Understands meaning of a process, nine knowledge areas of PMBOK, five process groups, the relation between a process group and knowledge of related area.
			Integrated Management	Understands meaning of integrated management, how integrated management is practiced to, and the outline of integrated management of PMBOK etc.
			Scope Management	Understands meaning of scope management and how it practices.
			Time Management	Understands meaning of time management and how it practices.
			Cost Management	Understands meaning of cost management, and how it practices, and the outline of cost management of PMBOK.
			Quality Management	Understands meaning of quality management, and how it practices.
			Human Resource Management	Understands meaning of human resource management, and how to practice it.
			Communication management	Uunderstands meaning of communication management and how it practices.
			Risk Management	Understands meaning of risk management and how it practices.
			Supply Management	Understands meaning of supply management and how it practices.
	Project Buildup and Planning			
		Project Integration Management	Project Charter Creation	Can create the project charter to which a project or a project phase is approved officially.
			Project Scope Description Draft Document	Can create the provisional version of the project and scope description documents that describe the scope on the high level.
			Project Management Plan Document Creation	Can define all the auxiliary plan documents, create and arrange an integrated adjustment, and make the required action for considering it as a project management plan documents.
		Project Scope Management	Scope Planning	Can draw up the project/scope/management plan documents that documented how project and scope is defined, verified or managed and how WBS is created and defined.
			Scope Definition	Can draw up a project/scope plan documents.
			WBS(Work/Breakdown Structure) Creation	Can partition main project component products and project work into the constituent components that are easy to manage.
		Project Time Management	Activity Definition	Can specify each concrete schedule/activity that must be carried out in order to generate each element product of a project.
			Activity Order Setup	Can clarify and document the dependency relation between schedule and activity.
			Activity Resource Estimation	Can estimate the type and necessary quantity of required resources for executing each schedule/activity.
			Activity Required Period Estimation	Can estimate the required work period for executing each schedule/activity.
			Scheduling	Can analyse an order of an activity, overall time, the requirements postulated about resources, and the constraints of a schedule, and create a project schedule.
		Project Cost Management	Cost Estimation	Can compute the estimate of the cost of resources required in order to complete the activity of a project.
			Cost Budgetting	Can calculate total of each activity and the estimated cost of a work/package, and can set up cost/baseline.
			Cost Control	Can grasp the difference over a project budget, and can manage change of a project budget.
		Project Quality Management	Quality Planning	Can draw up quality management plan documents that defines the organization for guaranteeing quality and improving in the plan process of a project, responsibility, a procedure, a process, and management resources, etc.
		Project Human Resource Management	Human Resource Planning	Can draw up human resourse management plan documents, and clarify the role in a project, responsibility, and report relations, and can documents it.
		Project Communication Management	Communication Planning	Can summarize the needs of the information and communication of a project/stakeholder.
		Project Risk Management	Risk Management Planning	Can decide how to tackle and how to process about the risk or management or activity of a project.
			Risk Discrimination	Can discern what kind of risk can give what kinds of influences on a project, and can document the characteristic.
			Qualitative Risk Analysis	Can attach priority foreword for the identified risk in order to make a subsequent action, such as quantitive risk analysis, the plan corresponding to a risk, etc.
			Quantitative Risk Analysis	Can analyze influences of a risk phenomenon, and can make a grade attachment of a numerical value to those risks.
			Risk Correspondence Planning	Can arrange the item that serves as a threat to a project target, and can opt for disposal.
		Project Supply Management	Purchase/Acquisition Planning	Can clarify a matter with the necessity for purchase or acquisition from the exterior when carrying out a project, and can decide what and how is purchased or acquired.
			Contract Planning	Can execute planning about a contract required for purchase/acquisition from the outside.
	Project Procurement and Control			
		Project Integration Management	Project Procurement Command and Management	Can undertake the work defined by the project management plan documents in order to attain the required project claims specified with the project or scope description documents.
			Project Work Check Control	Can check and manage the process for attaining the performance objective defined by the project management plan document.
			Integration Change Management	Can acknowledge and manage the change of all the products of a project.
			Project Termination	Can manage the procedure and results for making a project or a project/phase terminate officially.
		Project Scope Management	Scope Verification	Can make a formal acceptance of the completed product of project elements.
			Scope and Control	Can manage the change of project or scope.
		Project Time Management	Schedule and Control	Can manage the change of a project schedule.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Project Cost Management	Cost and Control	Can grasp difference over project budget, and can manage change of a project budget.
		Project Quality Management	Quality Assurance	Can execute the activity for guaranteeing that the product and process of a project are suitable quality in the execution process of a project.
			Quality Management	Can check whether the execution result of a project has satisfied quality standards, and can adopt the measure for removing a cause if there is a point that is not fulfilled.
		Project Resource Management	Project/Team Organization	Can carry out the process from supply of the necessary human resource to appointment, based on a personnel management plan documents.
			Project/Team Promotion	Can strengthen a team member capability in order to raise the performance of a project, and promote the exchange between team members.
			Project/Team Management	Can pursue peformance of a team or members, can carry out feed back, and can solve a subject, and can adjust change in order to raise the carry outance of a project.
		Project Communication Management	Information Distribution	Can provide a project stakeholder with the information needed.
			Track Record Report	Can distribute collection of all the baseline data and the distribution of a performance information to a stakeholder.
			Stake Holder Management	Can fulfill the needs of a project stakeholder and can manage the communication for solving a subject with a stakeholder.
		Project Risk Management	Risk Correspondence Planning	Can arrange the item that poses a threat to a project target, and can opt for disposal.
			Risk Check Control	Can pursue a risk of having identified, can supervise a residual risk, can identify a new risk, can carry out the plan corresponding to a risk, and can evaluate the effect.
		Project Supply Management	Delivery Reply Request	Can obtain an information, an estimate, a bid, an offer, proposal, etc. at any time.
			Delivery Selection	Can consider an offer, and can manage a contract and a mutual relation among delivery persons.
			Contract Management	Can manage the contract between a buyer and a delivery person and a mutual relation.
			Contract Termination	Can inform a delivery person of completion of the contract with a formal document.

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Information and Management				
	Information Strategy			
		Information System (ERP)	ERP Enterprise Resource Pla	Understands ERP package.
		Information System (SCM)	SCM Supply Chain Management	Understands the management technique that manages synthetically from upper part of active conduct of business to a lower part using a computer.
		Information System (CRM)	CRM Customer Relationship Management	Understands the technique of building a long term relation with a customer in the company by applying the information system.
		Information System (SFA)	SFA Sales Force Automation	Understands information system for attaining the increase in efficiency of the sales department of a company, making full use of IT.
		Information System (EAI)	EAI Enterprise Application Integration	Understands a series of technology and software that support making two or more computer systems used for business within work cooperate systematically, and attaining the increase in efficiency of data or a process.
		Information System (EA)	EA Enterprise Architecture	Can advance standardization related to the operating procedure and the information system of a huge organization, and optimization of the organization. Understands the methodology for aiming at management of an efficient organization.
		Information System (ASP)	ASP Application Service Provider	Understands the business that rents the application software for business to a customer through the Internet.
		Information System (DSS)	DSS Decision Support System	Understands a decision support system.
		Information System (SIS)	SIS Strategic Information System	Understands a strategic information system.
		Business Improvement, Analysis, Design	BPR(Business Process Engineering), Business Model	Understands business process engineering, an operating model, and a business model.
		Internet-Oriented Business	E Business /Dotcom Business. Virtual Company, SOHO	Understands E-Business, dot com business, a virtual company, SOHO, etc.
	Information System			
		Production Management System (Manufacturing)	Production Planning	Understands the business about management of the production planning information, including a production planning, a production planning input, a production planning list output, etc.
			Materials Requirements Planning (MRP)	Understands the foundations of MRP that calculates the quantity of the resources that should be ordered and order time from a bill of materials and the availability information on the assumption of production planning of a company.
			Process Planning Management	Understands the business about process plan and the management information, such as documented work instructions, a work track record input, a process and progress reference, and work track record reference.
			Cost Management	Understands the business about management of the cost information, including cost accounting processing, a standard cost table, the actual cost table classified by items, etc.
		Sales Management System (Manufacturing)	Ordering Management	Understands the business about management of the ordering information, including an ordering input, a necessary quantity input, an inventory mortgage at the time of an order received, and production planning mortgage function, etc.
			Shipment Management	Understands the business about the shipment information, including a shipment directions input, a shipment track record input, package shipment directions creation, package shipment track record creation, etc.
			Sales Management	Understands the business of management of the sales information, including sales appropriation processing, a sales input, a daily sales report, sales details, etc.
			Claim and Accounts-receivable Management	Understands the business about management of the information concerning a claim and credit sales, such as a payment input, a bill, a recovery schedule, and an account receivable ledger.
			EDI (Electronic Data Interchange) Function	Understands structure of EDI relation, such as JEITA/EDI correspondence and a CII translator.
		Purchase Management (Manufacturing)	Order Management	Understands the business about the information control concerning order of arrangements, a supplies leaving-the-garage input, an order, a supplies leaving-the-garage track record, a supplies leaving-the-garage schedule, etc.
			Arrival-of-Goods Management	Understands the business about the management of the information about acceptance including acceptance, inspection, an arrival-of-goods schedule, a late delivery, and what accepts and has not carried out inspection yet, etc.
			Purchase Management	Understands the business on management of the information about stocking, such as stocking, purchase details, the supplier according to subject, etc.
			Payment and Accounts Payable Management	Understands the business on management of the information about stocking and account payable, such as payment, a payment schedule, a payment statement, a creditor ledger, and the payable account balance.
		CAD/CAM/CAE	CAD Computer Aided Design	Understands computer systems that use a computer for the design of a building or an industrial commodity.
			CAM Computer Aided Manufacturing	Understands computer systems that use a computer for control of the production line of a factory.
			CAE Computer Aided Engineering	Understands computer systems that support design and development process of an industrial commodity.
		FA(Factory Automation)	FA(Factory Automation)	Understands the concept and computer systems that attain automation of a factory using the control technology of a computer.
		CIM(Computer Integrated Manufacturing)	Computer Integrated Manufacturing	Can generalize the variety of the information generated in production sites, such as manufacture information, technical knowhow and management information, with computer systems, and understands the concept and computer systems that attain the increase in efficiency of production.
		PDM(Product Data Management)	PDM(Product Data Management)	Can unify and manage all the information in connection with a design and development in the development process of an industrial commodity, and understands the concept of an information system and computer systems in attaining increase in efficiency of a process and shortening of a period.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Accounting, Finance, Personnel System	Finance Management System	Understands the business on management of accounting and the financial information, such as basic accounts, raising funds management, note management, fixed assets management, and administrative accounting.
			Debts-and-Credits Management System	Understands the business that manages the debts-and-credits information, including a claim, a debt, payment, payment, etc.
			Payroll Calculation /Personnel Management System	Understands the business that manages the information about payroll calculation and personnel affairs.
		Sales Support System	Sales Support System	Understands operating support system that is a supportive tool for realizing the increase in efficiency and strengthening of operating activities, utilizing IT.
		POS(Point of Sales)	POS(Point of Sales) Function	Understands the functions of POS, such as a sales function, a customer and the merchandise information management, master management, settlement of accounts and check, a basic setup, an operating function, and communication business.
		Distribution System	Master Management	Understands the management on masters, such as a regular assortment, a bargain sale, order, and a POS master.
			Data Analysis	Understands the accumulation to various databases of data generated in the backbone system, the practical use method of data, linkage with DWH, etc.
			Management	Understands functions of management systems, such as sales in a store and section unit, stocking, a gross income, stock, and a loss.
			Goods Order and Supplement	Understands the business on supplement of goods, such as order, returned goods, movement, abandonment and abandonment, and stocktaking.
		Finance System	Banking System	Understands the bank system application, such as the online calculation system and the on-line information system.
			Security System	Understands securities business application system, such as a securities business system and an online securities front system.
			Insurance System	Understands insurance system applications, such as contract examination and asset management.
			Agricultural Cooperative Society System	Understands agricultural cooperative association system applications, such as online calculation system, an agricultural cooperative association economic system, and comprehensive negotiable securities.
		Public Business System	Government Enterprise Accounting System	Understands the accounting data process for public works.
			Water-Rates System	Understands information control concerning with charge collection business of water rates.
			Public Library System	Understands business, such as a loan and return in a counter, order of book, the acceptance, the check of books collection in a back yard, and the information guidance.
			Allowance Children Management System	Understands business concerning with information control of a child-support allowance system.
			Childcare Operating System	Understands business concerning with information control about childcare business.
			Public Housing Management System	Understands business on management of the data concerning management of a tenant and storage management.
			Nonprofit Foundation Accounting System	Understands business concerning information management of accounts business peculiar to a foundation and a corporation, such as budgetized issue and journalizing.
		Business-to-Business System	VAN(Value Added Network)	Understands VAN(Value Added Network).
			EDI(Electronic Data Interchange)	Understands EDI(Electronic Data Interchange).
			CALS(Continuous Acquisition Life-Cycle Support)	Understands CALS(Continuous Acquisition Life-cycle Support).
			EC(Electronic Commerce)	Understands EC(Electronic Commerce).
		Electronic Clearing System	Electronic Clearing System	Understands structure of the home banking that makes price payment of goods electronically, and an electronic banking by a credit card.
		Groupware	Groupware Function	Understands the functions of groupware.
			Groupware Software	Understands groupware software (product).
		Work Flow Control Tool	Work Flow Function	Understands the functions of a workflow
			Work Flow Software	Understands workflow software (product).
			Work Flow Introduction	Understands application to business using workflow software.
	Management Engineering			
		IE (Industrial Engineering)	IE (Industrial Engineering) Analysis Method	Understands working-hours analysis, the work sampling, the process analysis, and the ABC analysis.
			OC(Operating Characteristic) Curve	Understands the curve that shows the relation between lot quality and its probability of passing by the random inspection.
			Control Diagram and Graph	Can draw diagram of the value measured for quality control, and understands the chart that analyzes a tendency.
		OR (Operation Research)	Optimization Problem	Understands an optimization problem.
			Decision Theory	Understands a decision making theory.
			Games Theory	Understands a games theory.
			Probability and Statistics	Understands probability and statistics.
			Distribution Function	Understands the distribution function.
			Markov Process	Understands the Markov process.
			Simulation	Understands the simulation.
			Queuing Theory	Understands the queuing theory.
			Pediction Technique	Understands the prediction technique.

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Business Skill				
	Business Basics			
		Business Manner	Speaking	Understands a suitable talking way for a business scene (a greeting, wording, etc.) and can practice it.
			Reception	Understands a suitable mode of communication in a business scenario (a telephone, business card exchange, visit, greeting, wording, etc.) and can practice it.
			Appearance	Understands appearance as a member of society and an attitude and can practice it.
		Business Mind	Basic Issues in Business	Understands 5S (manners/arrangement/order/upbringing/cleaning) and can practice it. Can practice action in accordance with an internal rule. Understands and can practice notes in a public space.
			Basic Business Mind	Understands basic view in order to polish a business mind. Understands skill system required in order to polish the business mind.
			Business Person Attitude	Understands the importance of time and how to manage a meeting and can practice it. Understands the humanity and the basic position that will be the requisite for the skill of listenning.
			Reporting, Correspondence and Consultation	Can understand a policy, directions and command. Understands and can practice the method of timely report, connection, abd consultation.
			Motivation	Understands meaning of working and can raise its motivation. Understands mental attitude over business.
		Business Rule	Corprate Organization Understanding	Understands the basic regulation about incorporated company. Understands the mechanism of executing business as a company organization.
			Information Security	Understands meaning and the importance of confidentiality of an information in business society. Understands the point used as a key when treating corporate an information.
			IT Security	Understands and grasp the potential risk in connection with IT. Is mastered IT preventing from a trouble.
		Compliance	Compliance Understanding	Understands meaning of compliance (legal compliance). Understands the importance of compliance.
			Related Statute	Understands statutes relevant to compliance, such as the act for protection of computer processed personal data, the product liability law intellectual property rights, antimonopoly law unfair competition prevention law sexual harassment prevention, and the labor standard law
	Legal Affair			
		Personal Data Protection	Law	Understands a criminal code, a control law of injustice access, and the act for protection of computer processed personal data.
			Protection	Understands risk of disclosure by digitization and its protection method.
			P Mark	Understands a privacy mark system and the act for protection of computer processed personal data.
		Intellectual Property Rights	Purpose	Understands purpose, definition and meaning of intellectual property rights. Understands outline of an intellectual property-related regulation.
			Problem	Understands problems about a patent, a utility model, a design, a trademark, and copyright (application procedure, correspondence to infringement, and a licensing agreement). Understands the example and the related problem about trade secrets.
		Business Judicial Affairs	Commercial Law	Understands outline of company law (the meaning and the type of company). Understands outline of a negotiable securities method (negotiable securities and notes). Understands outline of corporate governance and compliance.
			Contract Relation	Understands outline about the law of property (the global image of the law of property, and the process from conclusion of a contract to an entry into force). Understands the legal regulation about a series of processes, such as contract creation and sealing.
			Legal Affairs to Specific Business	Understands judicial affairs in connection with the special sale, such as a contract with a personal consumption person, a mail order, installment sales, etc. Is mastered the legal knowledge at the time of dealing with special goods, such as real estate.
	Sales			
		Root Sales	Sales Process	Understands a series of processes in connection with the business from a target setup to conclusion. Grasp the procedure and point in each process.
			Sales Talk	Understands points of the theoretical and persuasive way of talking. Can carry out a suitable reception corresponding to a case flexibly.
			Consulting Sales	Can grasp needs of a customer and can form the plan corresponding to it. Can propose an original plan effectively.
		Sales Management	Sales Team Management	Can organize sales force team. Is mastered the skill for attaining a sales target by commanding a member.
			Sales Management	Is mastered knowhow, such as customer relations management and tactical sales planning. Can manage lawful business in sales force, and sales goals, etc.
		Tele-Marketting	Planning	Understands a series of processes, such as making a target setup and creation of the list to which a phone call is made etc. Can create telescript and can tell it to a marketter.
			Enforcement	Understands meaning and aim of tele-marketing. Can carry out suitable telephone reception based on telescript.
		Credit Management	Customer Evaluation	Understands points for guessing a customer's financial situation.
			Recovery	Understands the fundamental law knowledge in connection with loan collection. Understands a fundamental process and fundamental notes about the loan collection from a customer.
			Preservative Attachment	Is mastered the legal knowledge about security. Can undertake measures to collateralize a claim in consideration of various points.
		Claim Processing	Response	Can respond to a claim appropriately and can tie to the next, when it is received. Understands tips and the taboo of claim reception.
			Ex-Post-Facto Processing	Understands meaning and the importance of a claim Understands a series of processes, such as maintenance of organization, reception, and subsequent follow
	Finance and Accounting			

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
		Financial Statement	B/S(Balance Sheet) and P/L(Profit and Loss Statement)	Understands structure and meaning of B/S(Balance Sheet) and P/L(Profit and Loss Statement). Understands meaning of the numerical value displayed on financial statements and the approximate calculation method.
			Cash Fow Account	Understands structure of CF(Cash Flow) account, and the foundations of the creation method. Can carry out simple financial analysis using CF account.
		Finance Analysis	Elementary Financial Analysis	Can conduct a fundamental financial analysis using B/S and P/L.
		Bookkeeping	Bookkeeping Basics	Understands a series of flows in connection with bookkeeping in general. Understands positioning of the bookkeeping in company accounting.
			Journalizing	Understands method of the various accounting processings generated by active conduct of business.
		Receipts and Expenses	Note and Check	Understands a flow of the procedure of a note and a check and the legal regulation in connection with it. Can grasp a potential risk of a note and a check, and can carry out a suitable treatment preventing from a trouble.
	Labor Affair			
		Labor Judicial Affairs	Labor Law	Understands the foundations of labor law including the Labor Standard Law. Can make a lawful management of time and wages according to a legal regulation.
			Security and Hygiene	Understands regulation of labor security and hygiene law etc. Is mastered the knowledge for carrying out health administration of a suitable place of work based on legal regulation..
		Labor Management	Law-Abiding Management	Can carry out a lawful management on the occasion of situations, such as child-rearing and care of laborers. Understands the Equal Opportunities Act, and can make a place of work without discrimination or sexual harassment.
			Human Resourse Promotion	Can make the place of work that can harness various talented people using being home, flextime, etc. Understands the point that uses shorttime laborers as a working power.
			Capability Development	Is mastered the basic knowledge of talent management. Can create the suitable educational plan aimed at the target.
	Planning			
		Marketing	Marketing Theory	Understands basic theories, such as a product strategy, a price strategy, a channel strategy, and a promotional strategy.
			Marketing Research	Can formalize an exact research plan suitable for marketing needs. Understands research techniques, such as a questionnaire, an interview and a group interview
			CS (Customer Satisfaction)	Understands the foundations about customer satisfaction. Can formalize suitable CS(Customer satisfaction) plan suitable for the situation.
		Advertisement and Public Relations (AD PR)	Public Relations	Can formalize a suitable public-relations strategy based on the plan of top. Can carry out effective publicity work according to a public relations strategy.
			Promotion	Can formalize a suitable promotional strategy meeting the marketing strategy. Can carry out effective promotion activity that harnessed the characteristic for every technique.
		Statistical Data Analysis	Statistics Foundations	Understands the statistics foundation and can read and describe statistical data. Understands use and purpose of statistics analysis
			Description Statistics	Can create a frequency table and a histogram Understands the amount of key statistics showing a center and a scatter, and can analyse it using them Can sum up two-dimensional data and can visualize. Understands covariance, a correlation coefficient, and the relation between a correlation coefficient and a dispersion chart. Understands and can analyze the regression analysis that is the technique for analyzing the relation between two variables.
			Inferential Statistics	Understands discrete probability frequency and probability distributions (binomial distribution, Poisson distribution). Understands continued probability frequency probability distributions (a normal distribution, the Khai square distribution, etc.). Understands the central limit theorem Understands inference of the expected value and fraction of normal population. Understands the foundations of hypothesis inference.
			Advanced Statistics Method	Understands principal component analysis. Understands factor analysis. Understands cluster analysis.
		Planning Power	Planning Document Composition	Understands points, such as composition (a chapter forming) and format for expressing a plan to a partner logically and intelligibly. Understands the point of drafting a plan, required capability, and training method.
			Presentation Technique	Understands an effective way to use a figure or a table for communicating a plan intelligibly, and can draw up a planning document.
			Planning Power Cultivation	Understands the foundation of imaginative thinking. Understands how to advance a strategy planning. Understands the importance of Zero-Baced Thinking and Plus Thinking.
	Production			
		Production Management	Planning	Is mastered the basic knowledge of a product plan. Is mastered management and analysis skill of the design that is in charge of production.
			Operation	Is mastered the management knowhow of materials and stock. Is mastered the knowhow in connection with purchase.
		Logistics	Planning	Is mastered management knowhow, such as a distribution system and cost. Understands the environmental problem in connection with a distribution.
			Operation	Is mastered knowledge, such as stocktaking and management of input and output. Understands 5S, IE, etc.

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Statistics, Applied Mathematics and Information Science				Understands basic issues of probability and fundamentals of statistical analysis using a computer.
	Probability and Stochastic Data Analysis			
		Probability	Fundamental Probability	Understands the probability space, the event, the random variable, the conditional probability, and Bayes's theorems etc.
			Probablistic Distribution	Understands the average, the variance, the expected value, the binominal distribution, the normal distribution, the Poisson distribution, the geometrical distribution, the uniform distribution, and the exponential distribution, etc.
			Continuous Probability	Understands the random variable, the continuous probability distribution, the normal distribution, the average, the variance, the expected value, and the multivariate probability distribution, etc.
			Stochastic Process	Understands the stochastic process, the Brownian movement, the Bernoulli process, the Poisson process, and the Markov chain, etc.
		Statistical Analysis	Sampling Distribution	Understands sampling, the random nature, the low of large numbers, the central limit theorem, and the multivariate distribution.
			Inference	Understaands point estimation, interval estimation, unbiased estimates, estimation based on the likelihood estimation, the least squares method, confidence interbal.
			Test	Understands the hypotheses formulation and testing, the test based on the parameter, the t test, the chi-square test, and the variance analysis.
			Correlation and Auto Regression	Understands the relationship of the correlation and the regression, the scatter chart, the correlation coefficient, and the regression analysis, etc.
		Stochastic Model and Method	Queueing Theory	Understands the queueing theory, the single server queueing model, and the multiple server queueing model, etc.
			State Transition Model and Markov Chain	Understands the directed graph and the state transition, the state transition model, the Markov process, and the transition probability, etc.
			Monte Carlo Method	Understands random numbers, the methods of simulations, accuracy, and trial frequency etc.
		Multivariate Analysis	Outline of Multivariate Analysis	Understands the purpose and kinds of multivariate analysises, a scale of data, an explanatory variable, and a response variable.
			Principal Component Analysis	Unserstands the idea of a principal component analysis, a covariance, an eigenvalue, an eigenvector, and the method of a principal component analysis.
			Factor Analysis	Understands the idea of a factorial analysis, a linear model, factor loadings, and the method of a factorial analysis.
			Cluster Analysis	Understands the idea a cluster analysis, a distance measure, a hierarchical technique, and the optimal partitioning method etc.
			Multiple Regression Analysis	Understands the idea of a multiple regression analysis, a regression line, a least-squares method, and the method of a multiple regression analysis.
	Applied Mathematics for Economics and Finance			Understands a mathematical concept necessary in the business of economics and finance. Understands a basic important idea and the computational method in the financial engineering.
		Function and Algebra Basics	Function Basics	Understands characteristics of function, a linear equation, simultaneous equations, an exponential function, a logarithmic function, and Taylor's theorem
			Differencial of Function	Understands the differential of a function, a maximum and a minimum of a function, and an extreme value of a function etc.
			Integration of Function	Understands the integration of a function.
			Matrix and Linear Equations	Understands the operations of a matrix, a determinant, an inverse matrix, a covariance matrix, an eigenvalue and an eigenvector, and a linear
		Optimaization	Partial Differentiation, Maximum and Minimum of Function	Understands a partial differenciation and an optimaization of multivariable.
			Linear Programming Problem	Understands a linear programming, PERT, and a shortest path problem
			Least-square Method	Understands a least-square method.
		Probability Theory Basics	Random Variable and Probability Distribution	Understands a discrete probability distribution, a continuous probability distribution, a probability density function, an average, a variance, a binomial distribution, a Poisson distribution, and a covariance.
			Expectation	Understands an expectation of a continuous random variable and an conditional expected value.
			Multivariate Random Variable	Understands a multivariate random variable, a multivariate normal distribution, and a mixture of normal distributions.
		Stochastic Process Basics	Stochastic Process	Understands a time series model, a random walk, a Brownian motion, a continuous time probability model, and a conditional normal model etc.
			Stochastic Differencial Equation	Understands a stochastic differencial equation.
			Wiener Process	Understands the Wiener process which is a stochastic process that a Brownian motion produces.
			Poisson Process	Understands the Poisson process that is a basic stochastic process used to model various phenomena such as the guest's arrival, occurrences of breakdown, and births of individual.
		Basic Statistical Technique	Data Analisys	Understands the method of arranging data (sample) extracted from infinite population at random, and the characteristic value that summarizes obtained sampled values.
			Fundamental Theorem	Understands the fundamental matters such as the law of large numbers and the central limit theorem, etc.
			Important Distribution in Statistice	Understands a multivariaye normal distribution, a chi-square distribution, and t-distrinution, etc.
			Regression Model	Understands a single regression model, a multivariate regression model, and an autoregressive model.
			Statistical Estimation	Understands a posterior distribution, a sample nean, a sample variance, a statistical estimation such as a point estimation, a most likelihood estimation, an interval estimation, etc.
			Hypothesis Test	Understands the structure of hypotheses testings, the determination of testing method, a test concerning average of a normal population, and a test concerning percentage, etc.
		Numerical Solution	Generation of Random Numbers	Understands uniform random numbers, random numbers with a normal distribution, maulivariate random numbers.
			Monte Carlo Simulation	Understands the method to solve a numerical issue by generating random numbers.
	Financial Engineering			Understands the technological knowledge related to the decision making concerning the asset management, dealings, the risk hedging, the risk management, and the investment etc.
		Financial Derivative	Feature of Derivatives	Understands features of the transaction of financial derivatives.

Skill Category	Skill Subcategory	Skill Item	Skill Component	Skill Description
			Accounting Treatment of Derivative	Understands accounting treatment of reflection of derivatives transaction in financial statements etc.
			Kinds of Derivative Transaction	Understands content of derivatives transactions of a forward business, a swap transaction, and an option transaction etc.
		Modern Portfolio Theory	Risk and Earnings	Understands mean and variance, a diversified investment, a capital distribution line, and an efficient frontier, etc.
			Risk-free Assets	Understands mathematical representation of risk-free assets, a leverage of portfolio, a market portfolio, and a capital market line.
			Price Putting of Property	Understands a bond characteristic line, a capital asset pricing model (CAPM), a securities market line, and a risk apart.
		Mathematical Basis of Financial Derivatives	Black Scholes Partial Differencial Equation	Understands Black Sholes's partial differencial equation to decide an option price.
			Binomial Model	Understands the binomial model which is a model to find an option price by applying a change pattern of an original asset price and an option price to tree form.
			Monte Carlo Simulation	Understands the Monte Carlo simulation as a technique for evaluating commodity.
			Trinomial Tree and Finite Difference Method	Understands that by generalizing binomial tree model to trinomial tree model, to solve a partial differential equation using an explicit finite difference method is equivalent to calculating the expected value of the discount with a trinomial tree.
			Implied Tree and Exotic Option	Understands an implied tree and an exotic option.
	Concept of Usable Mathematics			Conceptual understanding of idea and methodology of mathematics that can be used real world
		Introductry Discrete Mathematics	Basic Graph Theory	understands basis of the graph theory, definition of a graph, characters of a graph, a weighted graph, the shortest route selection problem, the Steiner tree, the minimum Steiner tree, and outlines of terms of graph theory.
			Combinatorics Basics	Understands the basis of combinatorics like the counting of combinations, the shortest path problem, the number of enumerative combinations, the recurring formula, the generating function, and Catalan number, etc.
			Basic Game Theory	Understands idea of game theory, and basis of game theory like types of strategy, a payoff matrix, a zero-sum game, a payoff function, a minimax theorem, a prisoner's dilemma, and Nash Equilibrium, etc.
			Basic Algorithm	Understands what is the algorithm, and understands basis of algorithm like a computational complexity, a sorting, a bubble sorting, a selection sort, an insertion sort, a quick sort, and a bucket sorting, and a character string etc.
		Elementary Probability and Statistics	Elementary Probability Theory	Understands idea of probability, and bases of probability theory like an event, a simultaneous probability, conditional probability, a binomial distribution, a random variable, a sampling distribution, and a probability process, and a random walk, etc.
			Elementary Optimization	Understands idea of optimization and basis of idea of the optimum stopping problem
			Elementary Queueing Theory	Understands basis of queueing theory such as concept of queue, relation between queue and queue arrival and service distribution, sojourn time, queue length, share, queueing model (M/M/1), types of waiting time, and Little's law etc.
			Elementary Stochastical Test	Understands basis of statistical test like a random sampling, a mean, a covariance, a standard deviation, a mode, a median, an average of samples, an estimation, an estimated error, an alternative hypothesis, a null hypothesis, a test, P value, a significance level, number of samples, an outlier, a two-sided test and an one-sided test, and a degree of freedom etc.
		Elementary Information and Communication	Elementary Information Theory	Understands basis of information theory like information content, character of information content, bit, the entropy, source coding by Shannon, mutual information, and transmission capacity, etc.
			Elementary Error Detection and Correction	Understands idea of error detection and correction, and Elementary of error error detection and correction technology like a sum check, a check digit, coding, transmission channel, decoding, Hamming distance, error detection, error correction, Hamming code, and a cyclic code.
			Elementary Fractal and Celler Automaton	Understands basis of a fractal, a dimension, Koch curve, an one-dimentional cellular automaton, and a two-dimensional cellular automaton.
	Basic Complex Systems Science			Complex systems science is to understand an "alive" system such as the life, knowledge, and the society. Understand bases of the specific concept of a fractal, a chaos, and a cellular automaton, etc and the tool and models. Understands the complex systems such as the life, intelligence, and the society.
		Outline of Complex System	Concept of Complex Systems Science	Understands the viewpoint, the concept, and the image for exploring the complex systems science. Understands the meaning of emergence.
			Position of Complex Systems Science	Understands that the complex systems science aims to understand the life, intelligence, and the society, etc. , focussing on the generation, not on the existence.
			Methodology of Complex Systems Science	Understands outline of the simulation and the analogy that is a structural technique to understand the complex systems. Underatands that it is to observe the behavior of the model composed on the computer, and to understand the object.
		Concept and Tool of Complex System	Fractal	Understands the outline of a fractal that is the geometric structure with the self-similarity, Koch curve that is a fractal form, Kantor set, Peano curve, Silvinsky gasket, the power distribution, a fractal on the time axis, the fractal geometry, and the dimension which expresses complexty of a fractal. etc.
			Sele-organizing Critical State	Understands the self-systematic critical state hypothesis that the system that a lot of elements interact one another voluntarily changes to critical state. Underatands the rule concealed in the avalanche of the sand hill and the power law in the nature and the society.
			Chaos	Understands the chaos phenomenon that there is the event that conforms to the rules to an irregular phenomenon. Underswtands the meaning of linear mapping, nonlinear mapping, initial value dependency, and logistic mapping, etc.
			Edge of Chaos	Understands that the edge of chaos is an important area because it is located in the boundary of order and chaos and it maintains the flexible organization. Understands cellular automaton, one-dimension cellular automaton, the class separation, the parameter and the edge of chaos, the parameter and the complexity, and the edge of chaos etc.

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		Modeling of Complex System	Concept of Modeling	Understands that modeling of complex systems is that of the living thing paying attention to the mechanism of the information processing of the living things. Understands evolution and learning of a living thing as a complex adaptation system, a schema, fitness landscape, collective complex adaptation system, and the movement of an adaptive agent, etc.
			Evolution and Genetic Algorithm	Understands gene information, Darwin's theory of evolution, a selfish gene, and genetic algorithm etc.
			Kauffman's Network	Understands natural selection, self-organization, voluntary origin of life, voluntary order of gene networks, nonlinearities of gene, fitness landscope, and self-organization to edge of chaos, etc.
			Neural Network	Understands brain and its structure, the model of neural network, multilayered neural networks, and connection type neural network, etc.
			Celler Automaton	Understands the basic principle of one-dimension cellular automaton and two-dimension cellular automaton.
		Application of Complex System	Complex System Economics	Understands that economy and society are one typical model of complex system and the complex system economics aims to understands that it is one of the approaches toward the dynamic appearance of original economy Understands the neo-classical economics, complex system economics, components, time evolution and evolution, and structural research case in economics etc.
			Artificial Life	Understands that the artificial life is an attempt that approaches to the essence of a life by temporarily extracting the mechanism of a life, composes it on the computer, and compares the behavior with the reality. Understands that the artificial life in a life on the computer, the simulation of the crowd, and artificial life in complex system science etc.
			Chaos Connection System	Understands that the chaos connection system is the network where the components inventing chaos are connected. Understands the chaos connection model, the chaotic wandering, the chaos connection system and the brain, etc.
	Artificial Intelligence Fundamentals			Artificial intelligence aims to achieve various functions inventing human's intelligence on the computer. Understands the basic knowledge to construct artificial intelligence system
		Problem Solving	State Space Representation	Understands method of defining given problem by state space expression.
			Problem Partition Representation	Understands problem partition representation.
			Framework of Problem Solving	Understands the production system that is a general frame to solve search problem
			Pattern Matching	Understands pattern matching of a production system
			Forward Reasoning and Backward Reasoning	Understands reasoning of a production system.
		Search Method	Search Space and Search Graph	Understands search space and search graph.
			Blind Search	Understands depth-first search and breadth-first search.
			Heuristic Search	Understands best-first search, A* algorithm, and hill-climbing method, etc.
			OR Graph and AND/OR Graph Search	Understands search method in OR grapf and AND/OR graph.
			Search in Game	Understands min-max method and alpha-beta pruning, etc. in the search method in a game where other party exists, like Japanese chess and Go,
		Knowledge Representation and Inference	Rule-based Knowledge Representation and Inference	Understands description of knowledge by rule and framework to execute inference based on it.
			Frame-based Knowledge Representation and Inference	Understands frame-based knowledge representation method and inference method by frame.
			Knowledge Representation and Inference Based on Semantic Network	Understands knowledge representation method based on semantic network and inference method by semantic network.
		Predicate Logic	Knowledge Representation Based on Predicate Logic	Understands knowledge representation based on predicate logic.
			Inference Based on Predicate Logic	Understands inference method using knowledge represented by predicate logic.
			Horn Clause and Logic Programming	Understands knowledge represented by Horn clause and logic programming.
		Fuzzy Logic	Fussy Set	Understands Fussy set.
			Knowledge Representation Based on Fussy Logic	Understands the method to represent vague concept using Fussy descriptions.
			Inference by Fussy Logic	Understands inference by Fussy logic.
		Machine Learning	Deductive Learning	Understands learning model of deductive learning and production system
			Analogical Reasoning	Understands learning model and representation method of analogical learning, and application to a learning system
			Inductive Learning	Understands inductive inference and inductive learning.
			Support Vector Machine	Understande two-class pattern classification, linear separation, margin maximization, and mapping by Kernel function, etc.
			Reenforcement Learning	Understands basic items of reinforcement learning of strategies to decide behavior etc. that adapts to reward and environment
		Baysian Network	Basic Baysian Network	Understands basic Baysian network, the random variable, the conditional probability, a directed acyclic graph, and a belief.
			Inference by Baysian Network	Understands inference of causal relation by Baysian network.
			Learning of Baysian network	Understands learning of a conditional probability of Baysian network and learning of graph structure.
			Application of Baysian Network	Understands application of Baysian netvort to a prefernce system and a social system
		Neural Network	Basic Neural Network	Understands basic items of a unit, and a structure, etc.
			Multi-layer Neural Network	Understands the perceptron which is a basic form of a multi-layer network and a back propagation method.
			Mutually Connected Neural Network	Understands a neural network of a mutually connected type like Hopfield network and Boltzman machine, etc.
	Media Processing and Understanding			Understand application of artificial intelligence to madia processing and understanding
		Natural Language Understanding and Machine Translation	Outline of Natural Language Processing	Understands outline of a morphological analysys, a syntactic analysys, a semantic analysis, and a contextual analysis.

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			Syntactic Analysis	Understands a syntactic tree and outline of the method of parsing.
			Semantic Analysis	Understands various semantic representations such as semantic network, graph representation, and predicate logic formula, etc.
			Machine Translation	Understands the basic method of machine translation by a computer.
		Image Understanding	Image Processing	Understands outline of image processing that extracts significant features needed to image understanding from an image data.
			Two-dimentional Image Understanding	Understands outline of two-dimentional image processing such as a template matching and a feature-based matching, etc.
			Three-dimentional Image Understanding	Understands outline of three-dimentional image processing such as line-drawing understanding etc. that understand line drawing scene of polyhedron.
		Speech Processing	Speech Signal Analysis	Understands outline of analysis and feature extraction of speech signal.
			Soeech Recognition	Understands outline of important techniques for speech recognition, such as a speech duration detection, a pattern matching, Hidden Markov model, a language model, and serch, etc.
			Speech Understanding	Understands outline of structure model of speech understanding system.
			Speech Synthesis	Understands outline of speech synthesis such as concatenation method of record speech, parameter concatenating method, and synthesis by rule, etc.