CSE255 Examination Handout

In order to track the computing inventory of a large organization, the schema below has been designed.

Computer(CInventNum, ComputerName, ComputerType, AccID);
Accessory(AccID, AInventNum, HVendorID, AccName, AccType, AccSize);
Software(SInventNum, SVendorID, SWName, SWVersion);
Inventory(InvenNum, SerialNum, PONum, PODate, DeliveredDate, POCost, VendorID);
InstalledSoftware(CInventNum, SWInventNum);
HardwareVendor (HVendorID, HVName, HVAddr, ModelNum, ModelName, ModelDescr);
SoftwareVendor (SVendorID, SVName, SVAddr, SWName, SWVersion, SWDesc);
Vendor(VendorID, HWFlag, HWVendorID, SWFlag, SWVendorID);

Computer Table: A computer as identified by its ComputerType (PC, laptop, handheld, etc.) is tracked by an organization's inventory numbering scheme (CInventNum). ComputerName is a candidate key. Note that we cannot use serial numbers since we cannot guarantee uniqueness across vendors. Each computer tuple may have multiple accessories (AccID) - see below; hence the key of InventNum and AccID for this table.

AccessorySet Table: For each computer, we track a set of accessories by identifier (AccID) and by vendor (HVendorID) by using a three tuple of name (AccName such as Keyboard, Mouse, Monitor, CR_RW, DVD, external disk, etc.), type (AccType - for Keyboard, the AccType's could be regular, wireless, thumb, etc.), and for some AccTypes, the size (AccSize - for Monitor, it could be the diagonal length while for external disk it could be the number of gigabytes). The same AccName may be differentiated by AccID, VendorID, AccType, and AccSize combination. Accessories must be from hardware vendors and are purchased (AInventNum).

Software Table: Software that the organization has purchased is in the software table and is tracked by the organization's inventory numbering scheme (SInventNum - a primary key); thus, software can only be from software vendors. For each piece of software (operating system, database, document, etc.) we also track the triple of a software vendor ID (SVendorID), name of the software (SW Name such as Windows, MacOS, Oracle, PalmOS, etc.), and version of the software (SWVersion such as 1.1, 2.0, 1.3, 2000, XP, etc.). All of these values must be non-null.

Inventory Table: This table tracks any of the hardware or software that has been purchased. The purchase order number (PONum) is the key, and unique for anything purchased by the organization. The inventory number (Inven) is unique across all purchased items, but is initially null until the item arrives. The serial number may not be unique since different manufacturers can reuse numbers (and it is also null until the item arrives). The PODate, POCost, and VendorID are known at the time of purchase; the DeliveredDate is set upon delivery of the item and is null until that point in time.

InstalledSoftware: This table contains linkages that track the installed software (via SWInventNum) on each hardware device (via CInventNum).

HardwareVendor: For each hardware vendor, there is a unique ID (HVendorID), name (HVName), address (HVAddr), model number (ModelNum), model name (ModelName), and description (ModelDescr). Note that HVendorID in conjunction with ModelNum is used to uniquely identify every product.

SoftwareVendor: For each software vendor, there is a unique ID (SVendorID), name (SVName), address (SVAddr), software name (SWName), version (SWVersion), and description (SWDescr). Note that SVendorID in conjunction with SWName and SWVersion is used to uniquely identify every product.

Vendor: In order to track all vendors with a common unique key, this table introduces an artificial VendorID. If the HWFlag (SWFlag) is true, then HVendorID (SVendorID) has a value. Note that both can be true, when means that a vendor is both a hardware and a software vendor.

Data types and values:
VendorID (V1, V2, V3, …); HVendorID (HV1, HV2, HV3, …); SVendorID (SV1, SV2, SV3, …); AccID(A1, A2, A3,…); InvenNum, SInventNum, CInventNum, AInventNum: Integer; HWFlag, SWFlag: Boolean; PODate, DeliveredDate: Date; POCost: float; and all remaining fields not yet listed are String.

CSE255 Examination Handout

Computer(CInventNum, ComputerName, ComputerType, AccID);

CInventNum	ComputerName	ComputerType	AccID
123456789	Server1	Server	A1
123456789	Server1	Server	A2
999999999	Laptop1	Laptop	A3
888888888	CEO_PDA	PDA	A5
888888888	CEO_PDA	PDA	A6

Accessory(AccID, AInventNum, HVendorID, AccName, AccType, AccSize);

AccID	AInventNum	HVendorID	AccName	AccType	AccSize
A1	111111111	HV111	Tape	Reel	20MB
A2	222222222	HV777	KB/Mouse	Wireless	null
A3	333333333	HV555	Mouse	Wireless	null
A4	444444444	HV444	ExtHD	USB	120GB
A5	878787878	HV333	ThumbKB	Plugin	null
A6	101010101	HV333	Headph	Plugin	null

Software(SInventNum, SVendorID, SWName, SWVersion);

SInventNum	SVendorID	SWName	SWVersion
454545454	SV124	Windows	XP
555555555	SV124	VisualC++	5.0
000001111	SV001	VMS	7.0
999990000	SV001	C	3.1
777777777	SV573	Together	5.0
565656565	SV222	PalmOS	2.3

Inventory(InvenNum, SerialNum, PONum, PODate, DeliveredDate, POCost, VendorID);

InvenNum	SerialNum	PONum	PODate	DeliveredDate	POCost	VendorID
123456789	Vax3424	P02348	10-08-83	12-22-83	250,000	V00002
		P35363	07-07-07		1,999	V00005
999999999	D3kc830	P98673	02-22-06	03-10-06	2,394	V00005
454545454	458sdaf	P43625	01-01-05	01-15-05	299	V00003
		P43652	10-08-07		8,354	V00234
111111111	Dec3421	P02349	10-08-03	12-22-83	40,000	V00002
444444444	WDKD234	P48572	09-09-07	09-09-15	129	V00001
888888888	DF88DFD	P34523	01-02-07	01-23-07	499	V00006

InstalledSoftware(CInventNum, SWInventNum);

CInventNum	SWInventNum
123456789	000001111
123456789	999990000
999999999	454545454
999999999	555555555
999999999	777777777
888888888	565656565

HardwareVendor(HVendorID, HVName, HVAddr, ModelNum, ModelName, ModelDescr);

HVendorID	HVName	HVAddr	ModelNum	ModelName	ModelDescr
HV111	DEC	MaynardMA	750	Vax	Minicomputer
HV111	DEC	MaynardMA	11-44	PDP	Microcomputer
HV897	Dell	RoundRockTX	N1730	XPS	PC
HV777	MicroS	RedmondWA	4000	Wireless	Keyboard/Mouse
HV555	Logitech	FreemontCA	MX	Revolution	HighEnd Mouse
HV333	Palm	SunnyvaleCA	500	PalmPilot	Handheld

SoftwareVendor(SVendorID, SVName, SVAddr, SWName, SWVersion, SWDesc);

SVendorID	SVName	SVAddr	SWName	SWVersion	SWDesc
SV124	MicroS	RedmondWA	Windows	2000	OldOS
SV124	MicroS	RedmondWA	Windows	95	OlderOS
SV124	MicroS	RedmondWA	Windows	3.0	AncientOS
SV001	DEC	MaynardMA	VMS	7.0	MinicomputerOS
SV001	DEC	MaynardMA	C	3.1	ProgrammingLang
SV573	Borland	AustinTX	Together	5.0	UMLTool
SV222	Palm	SunnyvaleCA	PalmOS	2.3	HandheldOS

Vendor(VendorID, HWFlag, HWVendorID, SWFlag, SWVendorID);

VendorID	HWFlag	HWVendorID	SWFlag	SWVendorID
V00001	True	HV555	False	null
V00002	True	HV111	True	SV001
V00003	True	HV777	True	SV124
V00004	False	null	True	SV573
V00005	True	HV897	True	SV778
V00006	True	HV333	True	SV222