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Database Management

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Lab 7

1. Tycho CEO Fred Johnson has put together a spreadsheet of all the data he has so far, which he personally collected
 - a. As he shows you the spreadsheet, having just signed your consulting agreement, he asks you what you think of it. How do you reply?
 - i. As we discussed in class, it is best to first praise the system and then give a semi-honest opinion such as the following: "I think you all have started off on a good foot. You have the idea of what you need and I can see what you want to achieve, however I think with a little bit of tweaking, we can make it as efficient as it can be. If you'll allow me, I can suggest a few changes and you can determine which ones would work the best, how does that sound?"
 - ii. To place the data in first normal form, I would organize it like this:

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-2005	754.95
DB32	32808	12-03-2005	380.00
DB32	37691	06-15-2006	380.00
DB33	57772	05-27-2005	412.77
WP08	32808	01-12-2006	185.00
WP08	37691	06-15-2005	227.50
WP08	57222	05-27-2005	170.24
WP09	59536	10-30-2005	35.00
WP09	77740	05-27-2006	35.00

- iii. The primary key are the TagNumbers and PackgeID numbers

2. Add two columns of new data: one column for the software package name (e.g., Zork, Portal, etc) and one for computer model (e.g, IBM, Apple, etc). Be sure that your new data is consistent with the original data. Do not add any additional columns.
 - a. Display the new table

PackageID	TagNumber	InstallDate	SoftwareCostUSD	SoftwareName	ComputerModel
AC01	32808	09-13-2005	754.95	Zork	Lenovo T540
DB32	32808	12-03-2005	380.00	Portal	Dell Inspiron 15
DB32	37691	06-15-2006	380.00	Portal	Asus Ultrabook
DB33	57772	05-27-2005	412.77	Portal2	Toshiba Satellite
WP08	32808	01-12-2006	185.00	Batman	HP Pavilion 15z
WP08	37691	06-15-2005	227.50	MirrorsEdge	Lenovo T540
WP08	57222	05-27-2005	170.24	QuantemBreak	Samsung ATIV Book
WP09	59536	10-30-2005	35.00	Thief	Toshiba Satellite
WP09	77740	05-27-2006	35.00	Skyrim	MSI GP62 Leopard

- b. Identify and document all functional dependencies
 - i. (PackageID) → TagNumber, SoftwareName, Computer Model
 - c. This new table is not in third normal form because it has multiple key dependencies
 3. Decompose your 1NF table into a set of tables that are in at least third normal form. Remember that it's wrong to add artificial keys to associative entities. Do not add any additional columns

Software Data

PackageID	Software Cost	Install Date	Software Name
AC01	754.95	09-13-2005	Zork
DB32	380.00	12-03-2005	Portal
DB32	380.00	06-15-2006	Portal
DB33	412.77	05-27-2005	Portal2
WP08	185.00	01-12-2006	Batman
WP08	227.50	06-15-2005	MirrorsEdge
WP08	170.24	05-27-2005	QuantemBreak
WP09	35.00	10-30-2005	Thief
WP09	35.00	05-27-2006	Skyrim

Computer Data

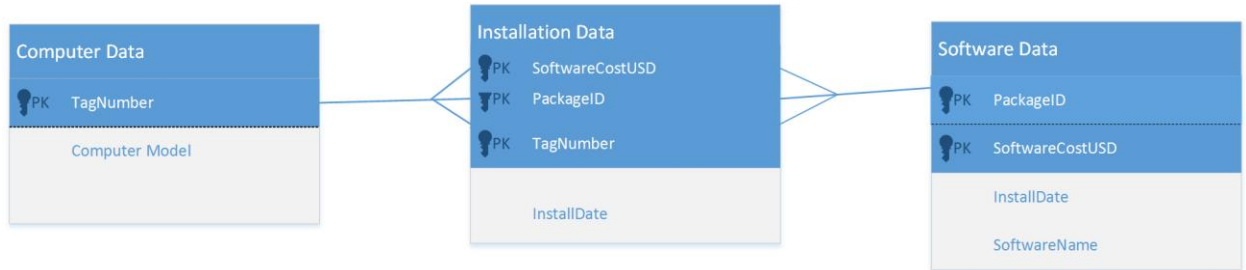
TagNumber	ComputerModel
32808	Dell Inspiron 15
37691	Lenovo T540
57772	Toshiba Satellite
32808	HP Pavilion 15z
37691	Lenovo T540
59536	Samsung ATIV Book
77740	MSI GP62 Leopard

Installation Data

PackageID	TagNumber	InstallDate
AC01	32808	09-13-2005
DB32	32808	12-03-2005
DB32	37691	06-15-2006
DB33	57772	05-27-2005
WP08	32808	01-12-2006
WP08	37691	06-15-2005
WP08	57222	05-27-2005
WP09	59536	10-30-2005
WP09	77740	05-27-2006

- a. Identify all primary keys (Determinates) for all tables
 - i. Here, the primary keys are made of composite keys:

1. PackageID+SoftwareCost+InstallDate
 2. TagNumber+PackageID
- b. Identify all functional dependencies for all tables
- i. SoftwareName → InstallDate, SoftwareCost, PackageID
- c. Explain why the new tables are in third normal form
- i. The new tables are in third normal form because they're in second and first normal form, through being atomic and as well as eliminating any multiple key dependencies.



4.