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**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 what you think of it. How do you reply?**

- 1) You tell the CEO he has done a great job. That he is very easy to read the data in the spreadsheet. You thank him for his hard work and for gathering all the data for you. You tell him that you need to rework the table to have isolated data and have to put the data into 1NF(First Normal Form).

**b) Put this data in 1NF and Display it. (Show me the table; No SQL.)**

Package ID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-2005	\$754.95
DB32	32808	12-03-2005	\$380.00
DB32	37681	06-15-2005	\$380.00
DB33	57772	5-27-2005	\$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	05-27-2005	\$35.00

**c) Primary Key:** is going to be a Composite of (PackageID,TagNumber).

The Composite key is the best option i believe for a table set up this way since it allows you to look at a Package ID and cut through all the package id with the TagNumber to give you exact computer you are looking for.

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

**a) Display a New Table**

Package ID	TagNumber	InstallDate	SoftwareCost USD	SoftwarePackage ID	Computer Model
AC01	32808	09-13-2005	\$754.95	Zonk	Asus
DB32	32808	12-03-2005	\$380.00	Zonk	Samsung
DB32	37691	06-15-2005	\$380.00	Portal	Samsung
DB33	57772	5-27-2005	\$412.77	Graphic	Microsoft
WP08	32808	01-12-2006	\$185.00	Zonk	Apple
WP08	37691	06-15-2005	\$227.50	Portal	Apple
WP08	57222	05-27-2005	\$170.24	Graphic	Apple
WP09	59536	10-30-2005	\$35.00	POS	Lenovo
WP09	77740	05-27-2005	\$35.00	Net	Lenovo

**b) Identify and Document all functional dependencies**

- i) PackageID + Tagnumber |-> InstallDate,SoftwareCostUSD,SoftwarePackageID,ComputerModel

**c) Explain why this new table is not in third normal form.**

- i) This table is not in "3NF" because the data need to broken down more to allow you to find the exact device you are looking for. Right now it is hard to find the exact device you are looking for. Since there is too much data in this table.

3)Decompose your 1NF table into a set of tables that are in at least third normal form.(BCNF would be better.)Remember that it's wrong to add artificial keys to associative entities. Actually as i said before do not add any additional columns.

a) Identify all Primary keys(Determinants) for all tables.

They way this new table is design the only primary key you would need is the Package ID

b) Identify all functional dependencies for all tables.

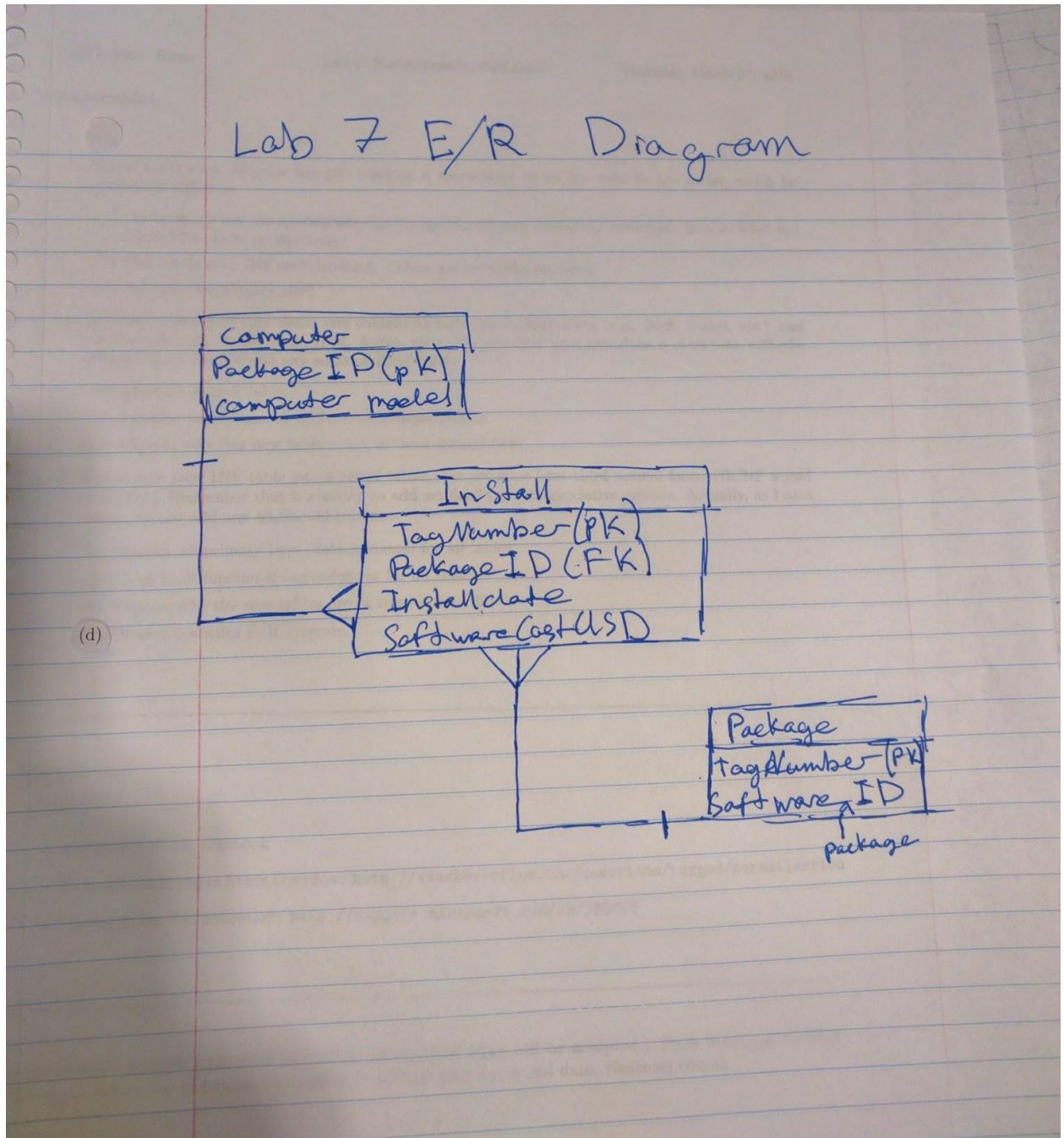
Package ID |-> computer model

TagNumber |-> software ID

Package ID + TagNumber |->Install Date

c) Explain why the new tables are in third normal form

Every primary attribute is associated to the Primary key. The transitive functional dependency from the table before has been eliminated



d) Draw a Beautiful E/R diagram.