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Normalization Homework # 1

Part One

1. As he shows you the spreadsheet, having just signed your consulting agreement, he asks what you think of it. How you reply?

The spreadsheet needs to be redone because more than one TagNumber
is linked to a PackageID in the table. This would make it much more difficult to locate the data in an efficient manner and can also lead to a lack of data integrity.

2. Put his data in 1NF and display it. Show me the table; not SQL

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	9/13/2005	754.95
DB32	32808	12/3/2005	380
DB32	37691	6/15/2005	380
DB33	57772	5/27/2005	412.77
WP08	32808	1/12/2006	185
WP08	37691	6/15/2005	227.5
WP08	57222	5/27/2005	170.24
WP09	59836	10/30/2005	35
WP09	77740	5/27/2005	35

3. What is the primary key?

The primary key for the combination of PackageID and TagNumber or (PackageID.TagNumber)

Part 2

1. Display the new table

PackageID	TagNumber	InstallDate	SoftwareCostUSD	SoftwarePackageName	ComputerModel
AC01	32808	9/13/2005	754.95	Zork	HP
DB32	32808	12/3/2005	380	Portal	HP
DB32	37691	6/15/2005	380	Portal	Apple
DB33	57772	5/27/2005	412.77	Adobe	Dell
WP08	32808	1/12/2006	185	TEG	HP
WP08	37691	6/15/2005	227.5	TEG	Apple
WP08	57222	5/27/2005	170.24	TEG	Microsoft
WP09	59836	10/30/2005	35	LOL	Apple
WP09	77740	5/27/2005	35	LOL	HP

2. Identify and document all the functional dependencies

A. Tag number functionally determines ComputerModel

B. PackageID functionally determines SoftwarePackageName

C. PackageID and TagNumber and InstallDate determines SoftwareCostUSD

3. Explain why this new table is not in third normal form.

It is true that for any table to be in third normal form, it must also first be in second and first normal form. This relation is not in second normal form because in seocnd normal form all of the non-key attributes are dependent on all parts of the primary key. The attribute, for example SoftwarePackageName, is only dependent on the packageID, even though it needs to be dependent on both PackageID and Tag Number.

Part 3

1. Identify all primary keys (determinants) for all tables

    A. PackageID + TagNumber for the table *Installs*
    B. PackageID for the table *Software Packages*
    C. TagNumber for the table *Computers*

2. Identify all functional dependencies for all tables.

Installs

PackageID and TagNumber and InstallDate functionally determine SoftwareCostUSD

Software Packages

PackageID functionally determines SoftwarePackageName

Computers

TagNumber functionally determines ComputerModel

3. Explain why the new tables are in third normal form.

These new tables are in third normal form because they meet both first and second normal form rules. The new tables are also in third normal form because all of the non key attributes are not dependent on any other non key attributes.

4. Draw a beautiful E/R diagram.