Mackenzie O'Brien Lab 7

Part One:

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-2005	754.95
DB32	32808	12-03-2005	380.00
	37691	06-15-2005	380.00
DB33	57772	05-27-2005	412.77
WP08	32808	01-12-2006	185.00
	37691	06-15-2005	227.50
	57222	05-27-2005	170.24
WP09	59836	10-30-2005	35.00
	77740	05-27-2005	35.00

1. What do you think of the spreadsheet?

   Although the information will be helpful in creating a table(s) for the database, the data has redundancy and must go through normalization in order to protect the data and make sure that there is flexibility in the database. Some rows have multiple entries in a column, and must be fixed.

2.

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-2005	754.95
DB32	32808	12-03-2005	380.00
DB32	37961	06-15-2005	380.00
DB33	57772	05-27-2005	412.77
WP08	32808	1-12-2006	185.00
WP08	37691	06-15-2005	227.50
WP08	57222	05-27-2005	170.24
WP09	59836	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

3. What is the primary key?

   No column by itself can serve as the primary key as there is no one column that uniquely identifies all elements of a table. However, a composite key made up of PackageID and TagNumber can be used as a primary key.

Part Two: Add two columns of new data, one for software package name, and one for computer model. Be consistent with the original data.

4.

PackageID	TagNumber	InstallDate	SoftwareCostUSD	SoftwarePackage	ComputerModel
AC01	32808	09-13-2005	754.95	Portal	Apple
DB32	32808	12-03-2005	380.00	Eclipse	Apple
DB32	37961	06-15-2005	380.00	Eclipse	HP
DB33	57772	05-27-2005	412.77	Photoshop	Lenovo
WP08	32808	1-12-2006	185.00	Microsoft Office	Apple
WP08	37691	06-15-2005	227.50	Microsoft Office	HP
WP08	57222	05-27-2005	170.24	Microsoft Office	Lenovo
WP09	59836	10-30-2005	35.00	McAfee	Dell
WP09	77740	05-27-2005	35.00	McAfee	Dell

5. Identify all functional dependencies.

   TagNumber → CompModel

   PackageID → SoftwarePackage

   PackageID + TagNumber → InstallDate, SoftwareCostUSD

6. This table is not in third normal form as it is not even in second normal form currently. To be in third normal form, a table must be in second normal form, which means it must be in first normal form and have no unwanted partial key dependencies. Then, to be in third normal form, a table must not have any multi-key dependencies. Since neither ComputerModel nor SoftwarePackage depend on both PackageID AND TagNumber (the composite primary key), they should be in separate tables.

Part 3: Decompose the table into a set of tables that are at least in 3NF

Installations

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-2005	754.95
DB32	32808	12-03-2005	380.00
DB32	37691	06-15-2005	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	59836	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

Software

PackageID	SoftwarePackage
AC01	Portal
DB32	Eclipse
DB33	Photoshop
WP08	Microsoft Office
WP09	McAfee

Computer Models

TagNumber	ComputerModel
32808	Apple
37691	HP
57772	Lenovo
57222	Lenovo
59836	Dell
77740	Dell

7. Identify all primary keys (determinants) for all tables
    a. The primary key for ComputerModels is TagNumber
    b. The primary key for Software is PackageID
    c. The primary key for Installations is a composite key consisting of PackageID and TagNumber
8. Identify all Functional dependencies for all tables
    a. ComputerModels
        i. TagNumber → ComputerModel
    b. Software
        i. PackageID→ SoftwarePackage
    c. Installations
        i. PackageID +TagNumber → InstallDate
        ii. PackageID + TagNumber → SoftwareCostUSD
9. Explain why the new tables are in third normal form.
    a. The tables are in third normal form because it is already in second normal form and I removed the partial key dependencies. Secondly, there are no multi key dependencies. This means that the dependencies are not dependent on anything other than the primary/composite key.

10. Draw an ER Diagram