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Lab 7: Normalization A

1. I would reply “While the table is good at providing the groundwork for a better relational database, there can be some improvements so that it will be better utilized in the database I will be designing for you, such as sorting it into a more proper first normal form so that there are distinct rows for each item.”

2. Table 1: Sorted

| Package ID | Tag Number | Install Date | SoftwareCostUSD |
| --- | --- | --- | --- |
| AC01 | 32808 | 09-13-2005 | 754.95 |
| DB32 | 32808 | 12-03-2005 | 380.00 |
| DB32 | 37691 | 06-15-2005 | 380.00 |
| DB33 | 57222 | 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 |

3. The primary key of this table is a compound key between both Package ID and Tag number, as both seem to relate to different aspects of the table. Tag number seems to have to do with the individual software cost prices while Package ID seems to be part of another system where it is related to the software cost.

4. Table 2

| Package ID | Tag Number | Install Date | SoftwareCostUSD | SoftwarePackageName | Computer Models |
| --- | --- | --- | --- | --- | --- |
| AC01 | 32808 | 09-13-2005 | 754.95 | Zork | HP |
| DB32 | 32808 | 12-03-2005 | 380.00 | Portal | HP |
| DB32 | 37691 | 06-15-2005 | 380.00 | Portal | Mac |
| DB33 | 57222 | 05-27-2005 | 412.77 | Unix | Dell |
| WP08 | 32808 | 01-12-2006 | 185.00 | Windows | HP |
| WP08 | 37691 | 06-15-2005 | 227.50 | Windows | IBM |
| WP08 | 57222 | 05-27-2005 | 170.24 | Windows | Dell |
| WP09 | 59836 | 10-30-2005 | 35 | Norton | IBM |
| WP09 | 77740 | 05-27-2005 | 35 | Norton | Acer |

5. Functional Dependencies

* PackageID/TagNumber is the primary key
* PackageID/TagNumber → Install Date, SoftwareCostUSD
* TagNumber → Computer Models
* PackageID → SoftwarePackageName

6. This table is not in the third normal form because some columns are not functionally dependent on the primary key of the tables, such as the SoftwareName and ComputerModel columns of the table.

7. The primary keys for the new tables are as follows.

* Installations Table: Primary key is PackageID/TagNumber
* SoftwarePackage Table: Primary key is PackageID
* ComputerModels Table: Primary key is Tag Number

8. Here are the functional dependencies for the following tables

Installations

* PackageID/TagNumber → Install Date, SoftwareCostUSD

SoftwarePackages

* PackageID → SoftwarePackageName

ComputerModels

* TagNumber → Computer Models

Relationships between tables

* TagNumber(ComputerModels), PackageID (SoftwarePackage) → PID/TN (Installations)

9. All of the tables are in third normal form. This is because at their core, all attributes of each table are functionally dependent on the primary key of that table. This prevents there from being overlap when dealing with each of the tables, and why the computer models and software packages needed to be separated from the table.

10. E/R Model

