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Database Systems

Lab 7 Normalization:

**Part One:**

1. All the needed data is there, it can just be formatted better, so I will properly format your data to make it easier to access, as well as to insure there is no duplication in the data. With doing this it will insure that there is Data Integrity.

2.

|  |  |  |  |
| --- | --- | --- | --- |
| TagNum | PackID | InstallDate | SoftwareCost |
| 32808 | AC01 | 9/13/1995 | $754.95 |
| 32808 | DB32 | 12/3/1995 | $380.00 |
| 37691 | DB32 | 6/15/1995 | $380.00 |
| 57772 | DB33 | 5/27/1995 | $412.77 |
| 32808 | WP08 | 1/12/1996 | $185.00 |
| 37691 | WP08 | 6/15/1995 | $227.50 |
| 57222 | WP08 | 5/27/1995 | $170.24 |
| 59836 | WP09 | 10/30/1995 | $35.00 |
| 77740 | WP09 | 5/27/1995 | $35.00 |

3. The primary key is a compound key consisting of the TagNum and PackID.

**Part Two:**

4.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TagNum | PackID | InstallDate | SoftwareCost | SoftwarePackage | CompModel |
| 32808 | AC01 | 9/13/1995 | $754.95 | Zork | HP |
| 32808 | DB32 | 12/3/1995 | $380.00 | Portal | HP |
| 37691 | DB32 | 6/15/1995 | $380.00 | Portal | Dell |
| 57772 | DB33 | 5/27/1995 | $412.77 | Microsoft | Apple |
| 32808 | WP08 | 1/12/1996 | $185.00 | Angular | HP |
| 37691 | WP08 | 6/15/1995 | $227.50 | Angular | Lenovo |
| 57222 | WP08 | 5/27/1995 | $170.24 | Angular | Razr |
| 59836 | WP09 | 10/30/1995 | $35.00 | Bootstrap | Toshiba |
| 77740 | WP09 | 5/27/1995 | $35.00 | Bootstrap | Sony |

5.

TagNum, PackID -> InstallDate

TagNum, PackID -> SoftwareCost

TagNum -> CompModel

PackID -> SoftwarePackage

6. This table is not in third normal form because it is not in second normal form. There are parts of the data that apply to multiple parts of the data, which should be separated into multiple tables. Also SoftwarePackage does not depend on the primary compound key, so it should be placed in its own table; as well is the same for CompModel, since it depends on TagNum not the primary compound key.

**Part Three:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TagNum | PackID | | InstallDate | | SoftwareCost |
| 32808 | AC01 | | 9/13/1995 | | $754.95 |
| 32808 | DB32 | | 12/3/1995 | | $380.00 |
| 37691 | DB32 | | 6/15/1995 | | $380.00 |
| 57772 | DB33 | | 5/27/1995 | | $412.77 |
| 32808 | WP08 | | 1/12/1996 | | $185.00 |
| 37691 | WP08 | | 6/15/1995 | | $227.50 |
| 57222 | WP08 | | 5/27/1995 | | $170.24 |
| 59836 | WP09 | | 10/30/1995 | | $35.00 |
| 77740 | WP09 | | 5/27/1995 | | $35.00 |
| PackID | | SoftwarePackage | |
| AC01 | | Zork | |
| DB32 | | Portal | |
| DB33 | | Microsoft | |
| WP08 | | Angular | |
| WP09 | | Bootstrap | |
|  | |  | |
| TagNum | | CompModel | |
| 32808 | | HP | |
| 37691 | | Dell | |
| 57772 | | Apple | |
| 37691 | | Lenovo | |
| 57222 | | Razr | |
| 59836 | | Toshiba | |
| 77740 | | Sony | |

7. The primary keys are the compound key of TagNum and PackID for the first table. PackID is the other primary key, as well as TagNum for the two other tables.

8.

Table 1:

TagNum, PackID -> InstallDate

TagNum, PackID -> SoftwareCost

Table 2: PackID -> SoftwarePackage

Table 3: TagNum -> CompModel

9. The tables are in first normal form because they each have a primary key. They are also in second normal form because each column is fully dependent on its primary key. The tables are also in third normal form because all columns that do not rely on the primary key are removed from the table.

10.

