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CMPT 308

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October 31, 2014

**Part One:**

1. I would tell the CEO that, based on the way he set up the data in the spread sheet provided that his data would be compromised by inconsistency since it is not atomic, and therefore does not follow first normal form, which also means it does not follow any of the normal forms. Also, I would point out that the field name "SoftwareCost" is too vague since there is no currency specified (i.e. U.S dollars).

2.

| PackID | TagNum | InstallDate | SoftwareCost |
|--------|--------|-------------|--------------|
| AC01   | 32808  | 09-13-1995  | 754.95       |
| DB32   | 32808  | 12-03-1995  | 380.00       |
| DB32   | 37691  | 06-15-1995  | 380.00       |
| DB33   | 57772  | 05-27-1995  | 412.77       |
| WP08   | 32808  | 01-12-1996  | 185.00       |
| WP08   | 37691  | 06-15-1995  | 227.00       |
| WP08   | 57222  | 05-27-1995  | 170.04       |
| WP09   | 59836  | 10-30-1995  | 35.00        |
| WP09   | 77740  | 05-27-1995  | 35.00        |

3. There does not seem to be a primary key for the data provided, but one could be created.

**Part Two:**

4.

| PackID | TagNum | InstallDate | SoftwareCos | SoftwarePack | CompModel |
|--------|--------|-------------|-------------|--------------|-----------|
| AC01   | 32808  | 09-13-1995  | 754.95      | Minecraft    | HP        |
| DB32   | 32808  | 12-03-1995  | 380.00      | Warcraft     | HP        |
| DB32   | 37691  | 06-15-1995  | 380.00      | Warcraft     | Toshiba   |
| DB33   | 57772  | 05-27-1995  | 412.77      | Zork         | Apple     |
| WP08   | 32808  | 01-12-1996  | 185.00      | MS Office 2  | HP        |
| WP08   | 37691  | 06-15-1995  | 227.00      | MS Office 3  | Toshiba   |
| WP08   | 57222  | 05-27-1995  | 170.04      | MS Office 1  | Dell      |
| WP09   | 59836  | 10-30-1995  | 35.00       | Pacman       | Lenovo    |
| WP09   | 77740  | 05-27-1995  | 35.00       | Pacman       | Alienware |

5. Software Package → Pack Id      Software Package → Software Cost

TagNum → Computer Model

6. This table is not in third normal form since all the attributes in the table are not all dependent on the primary key.

### Part 3:

Software Table:

| SoftwarePack | PackID | SoftwareCost |
|--------------|--------|--------------|
| Minecraft    | AC01   | 754.95       |
| Warcraft     | DB32   | 380.00       |
| Zork         | DB33   | 412.77       |
| MS Office 2  | WP08   | 185.00       |
| MS Office 3  | WP08   | 227.00       |
| MS Office 1  | WP08   | 170.04       |
| Pacman       | WP09   | 35.00        |

Hardware Table:

Installs Table:

| TagNum | CompModel |
|--------|-----------|
| 32808  | HP        |
| 37691  | Toshiba   |
| 57772  | Apple     |
| 57222  | Dell      |
| 59836  | Lenovo    |
| 77740  | Alienware |

| TagNum_SWPack | TagNum | InstallDate | SoftwarePack |
|---------------|--------|-------------|--------------|
| 32808MC       | 32808  | 09-13-1995  | Minecraft    |
| 32808WC       | 32808  | 12-03-1995  | Warcraft     |
| 37691WC       | 37691  | 06-15-1995  | Warcraft     |
| 57771ZK       | 57772  | 05-27-1995  | Zork         |
| 32808MS2      | 32808  | 01-12-1996  | MS Office 2  |
| 37691MS3      | 37691  | 06-15-1995  | MS Office 3  |
| 57222MS1      | 57222  | 05-27-1995  | MS Office 1  |
| 59836PM       | 59836  | 10-30-1995  | Pacman       |
| 77740PM       | 77740  | 05-27-1995  | Pacman       |

7. The primary keys for the tables are SoftwarePack for Software, TagNum for Hardware and TagNum\_SWPack for Installs.

8. In the Software Table, SoftwarePack determines both PackID and SoftwareCost. In Hardware, TagNum determines the CompModel, and in the Installs table, TagNum\_SWPack determines SoftwarePack and TagNum. Installdate is determined on something the database cannot control in a sense, that being the actual date software is installed on a computer, so it does not have to be determined by the primary key.

9. The new tables are in third normal form because each of the attributes in each of the tables, with the exception of InstallDate, is determined only by the primary key in each table.

10.

