Kevin Scharr

Lab 7

1. I would say that this chart does not follow the first normal form rule. To follow the first normal form, the Package ID must appear in every row to properly label the table, but this will only satisfy the first normal form.

|  |  |  |  |
| --- | --- | --- | --- |
| 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 |

1. As the table appears now there is no primary key that could successfully define the table. The closest possibility is Installdate, but that repeats on 6/15/2005.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PackageID | TagNumber | InstallDate | SoftwareCostUSD | Software package name | computer model |
| AC01 | 32808 | 9/13/2005 | 754.95 | Zork | IBM |
| DB32 | 32808 | 12/3/2005 | 380 | Portal | IBM |
| DB32 | 37691 | 6/15/2005 | 380 | Portal | Apple |
| DB33 | 57772 | 5/27/2005 | 412.77 | Skyrim | Lanovo |
| WP08 | 32808 | 1/12/2006 | 185 | Kerbal Space Programs | Dell |
| WP08 | 37691 | 6/15/2005 | 227.5 | Kerbal Space Programs | Apple |
| WP08 | 57222 | 5/27/2005 | 170.24 | Kerbal Space Programs | Alienware |
| WP09 | 59836 | 10/30/2005 | 35 | Borderlands | HP |
| WP09 | 77740 | 5/27/2005 | 35 | Borderlands | Toshiba |

1. SoftwareCostUSD is dependant on Software package name. The price depends on the new software being installed. Computer model is dependant on tagnumber. The tag number determines which computer is being upgraded. Software package name is dependant on Package ID. The package ID dictates what is being installed.
2. Software cost is dependant on the software package name which is dependant on package ID. This creates a transitive dependency which violates the third normal form. There can be no transitive dependency.

Package Table

|  |  |
| --- | --- |
| PackageID | Software package name |
| AC01 | Zork |
| DB32 | Portal |
| DB33 | Skyrim |
| WP08 | Kerbal Space Program |
| WP09 | Borderlands |

Package Install Table

|  |  |  |
| --- | --- | --- |
| PackageID | InstallDate | SoftwareCostUSD |
| AC01 | 9/13/2005 | 754.95 |
| DB32 | 12/3/2005 | 380 |
| DB32 | 6/15/2005 | 380 |
| DB33 | 5/27/2005 | 412.77 |
| WP08 | 1/12/2006 | 185 |
| WP08 | 6/15/2005 | 227.5 |
| WP08 | 5/27/2005 | 170.24 |
| WP09 | 10/30/2005 | 35 |
| WP09 | 5/27/2005 | 35 |

Tag Table

|  |  |
| --- | --- |
| TagNumber | computer model |
| 32808 | IBM |
| 37691 | Apple |
| 57772 | Lanovo |
| 32808 | Dell |
| 57222 | Alienware |
| 59836 | HP |
| 77740 | Toshiba |

1. Primary Keys
   1. Package Table- The primary key of this table is the Package ID.
   2. Package Install Table- Primary key is PackageID and Install Date
   3. Tag Table- Primary key is the Tag number
2. Functional Dependencies
   1. Package Table- Software Package name is dependant on PackageID
   2. Package Install Table- SoftwareCostUSD is dependant of PackageID and install date
   3. Tag Table- ComputerModel is dependant on TagNumber
3. Third Normal Form
   1. First Normal Form- The intersection of all rows and columns are atomic, now there are no empty slots.
   2. Second Normal Form- No column is partially dependant on another. The primary key of the tables have columns that are dependant on them, but not on their subsets.
   3. Third Normal Form- No table has transitive dependencies, just functional.

