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Database Management
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Lab 7 – Normalization One

Part One

1) Well seeing as I had just signed my consulting agreement, I would tear apart the table as nicely as possible. I would start with the issue of non atomic values. For example, in searching for a specific computer found under the "PackageID", due to the multiple values found within one of the "PackageID" key, it is near impossible to find the exact one you are looking for. The exact same issue is found within the other two categories of "InstallDate" and "SoftwareCostUSD". I would explain to Miles Meservy, that if he wishes to be able to easily access specific parts of the data when it is needed, the first step to take would be to split up this one spreadsheets into several other different ones with less information. This process is known as Normalization and it simply allows you to divide and conquer the information. By taking one large collection of data and splitting them up into smaller and more structured tables, guarantees that no data will be lost and it can now be more readily updated with ease.

2)

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-05	754.95
DB32	32808	12-03-05	380.00
DB32	37691	6-15-2005	380.00
DB33	57772	5-27-2005	412.77
WP08	32808	1-12-2006	185.00
WP08	37691	6-15-2005	227.50
WP08	57222	5-27-2005	170.24
WP09	59836	10-30-2005	35.00
WP09	77740	5-27-2005	35.00

3) In the table that I have created above, the primary key is a composition between PackageID and TagNumber. They are both determinants for InstallDate and SoftwareCostUSD. It is considered to be in First Normal Form in that there are no multiple values anywhere, however, there is a large amount of redundant data.

Part Two

4)

PackageID	PackageName	TagNumber	CompModel	InstallDate	SoftwareCostUSD
AC01	Zork	32808	Apple	09-13-05	754.95
DB32	Portal	32808	Apple	12-03-05	380.00
DB32	Portal	37691	Lenovo	6-15-2005	380.00
DB33	Java	57772	IBM	5-27-2005	412.77
WP08	Adobe	32808	Apple	1-12-2006	185.00
WP08	Adobe	37691	Lenovo	6-15-2005	227.50
WP08	Adobe	57222	Dell	5-27-2005	170.24

WP09	Opera	59836	IBM	10-30-2005	35.00
WP09	Opera	77740	Microsoft	5-27-2005	35.00

5)
There are several functional dependencies within this collection of data. To start, the CompModel of the computer is dependent on the TagNumber of the computer. Similarly, the PackageID is the determinant for "PackageName". Lastly, the composition of both PackageID and TagNumber functionally determine both InstallDate and SoftwareCostUSD.

6)
This particular table that I have created above in number 4, is not in Third Normal Form (3NF) for several reasons. In order to be in third normal form, the table must be in second normal form first, as well as have no multiple dependencies. To begin, this is not in 2NF because of the partial key dependencies. For example, the PackageName is reliant on only the PackageID and the ComputerModel is only reliant on the TagNumber of the computer. And because the primary key is both the PackageID and the TagNumber, partial key dependencies are present and therefore not in second normal form. As I stated before, a table simply cannot be in third normal form if it is not in second normal form, therefore this table is not in 3NF.

Part Three

PACKAGES

PackageID	PackageName
AC01	Zork
DB32	Portal
DB33	Java
WP08	Adobe
WP09	Opera

COMPUTERS

TagNumber	CompModel
32808	Apple
37691	Lenovo
57772	IBM
57222	Dell
59836	IBM
77740	Micorsoft

ORDERS

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

7) In the Packages table, the primary key is PackageID. In the Computers table, the TagNumber is the primary key. And lastly in the Orders table, the primary key is the composition of both PackageID and TagNumber.

8) Within the Packages table, the PackageName is functionally dependent on the PackageID. In the Computer table, the CompModel is functionally dependent on the TagNumber of the computer. Lastly in the Orders table, InstallDate and SoftwareCostUSD are functionally dependent on both PackageID and TagNumber.

9) Each of the tables above are in third normal form. In each table, there is a primary key and every other non key attribute within the tables are fully dependent on the particular key. For example, within the Orders table, both the InstallDate as well as the SoftwareCostUSD are both functionally dependent on the PackageID and the TagNumber, not just partially.

10) E/R Diagram