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Database Management
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Lab 7

<center>Normalization One</center>

Part one:

1. The spreadsheet the CEO has created is way too chaotic and needs to be organized. At most intersections in this table, there is more than one value, such as numerous tags numbers, install dates and software costs for one value at a time: the package ID. This first of all, doesn't make the table atomic, which already violates 1st Normal Form. This spreadsheet would be hard to search should it get any larger and would not help with the original purpose of the table: to track software packages installed on their computers.

2.

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

3. The primary key would be the package ID and the tag number, since it is the determinant for many of the other columns. It determines the software cost and is related to the installation date. The tag number would be necessary to identify the computer that everything is installed on.

   Functional Dependencies:
   InstallDate → SoftwareCostUSD
   PackageID → SoftwareCostUSD

Part Two:

1.

PackageID	TagNumber	Computer Model	InstallDate	SoftwareCostUSD	SoftwareName
AC01	32808	IBM	09-13-2005	754.95	Norton Security
DB32	32808	IBM	12-03-2005	380.00	Visio
DB32	37691	Apple	06-15-2005	380.00	Visio
DB33	57772	IBM	05-27-2005	412.77	Visual Server
WP08	32808	IBM	01-12-2006	185.00	Office 365
WP08	37691	Apple	06-15-2005	227.50	Office 365
WP08	57222	IBM	05-27-2005	170.24	Office 365
WP09	59836	Apple	10-30-2005	35.00	Quicktime
WP09	77740	Apple	05-27-2005	35.00	Quicktime

2. Functional Dependencies:
    a. InstallDate → SoftwareCostUSD
    b. PackageID → SoftwareCostUSD
    c. PackageID → SoftwareName
    d. Tag Number → Computer Model
3. This table is not in third normal form because it doesn't validate second normal form, which is necessary. This table has a partial key dependency, which violates second normal form. The composite key, package ID and tag number, do not work for every column of the data. Tag number only determines computer model, while the rest of the columns are determined by package ID.

Part Three:
    1.

PackageID	SoftwareName
AC01	Norton Security
DB32	Visio
DB32	Visio

DB33	Visual Server
WP08	Office 365
WP08	Office 365
WP08	Office 365
WP09	Quicktime
WP09	Quicktime

TagNumber	Computer Model
32808	IBM
32808	IBM
37691	Apple
57772	IBM
32808	IBM
37691	Apple
57222	IBM
59836	Apple
77740	Apple

PackageID	TagNumber	InstallDate	SoftwareCostUSD
AC01	32808	09-13-2005	754.95
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WP08	57222	05-27-2005	170.24
WP09	59836	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

2. Primary Keys:
   Table 1: packageID
   Table 2: tagNumber
3. Functional Dependencies
   packageID → softwareCostUSD, softwareName, installDate
   tagNumber → computerModel
4. These tables are in third normal form because it validates second normal form since every primary key determines every other column in the table. Additionally, the tables do not have multiple key dependencies. In other words, there is only one candidate key in every table.