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**Part One:**

1. After looking at the given spreadsheet, I would tell Fred Johnson that the data provided is good but confusing and should be organized in a different, better manner. For clarity of the data, I would tell Mr. Johnson that he did a good job listing tag numbers in ascending order, but the table should be organized by *PackageID* and the *PackageID* should be repeated when it applies to more than one tag number.

2. 1NF:

PackageID	TagNumber	SoftwareCostUSD	InstallDate
AC01	32808	754.95	09-13-2005
DB32	32808	380.00	12-03-2005
DB32	37691	380.00	06-15-2005
DB33	57772	412.77	05-27-2005
WP08	32808	185.00	01-12-2006
WP08	37691	227.50	06-15-2005
WP08	57222	170.24	05-27-2005
WP09	59836	35.00	10-30-2005
WP09	77740	35.00	05-27-2005

3. The primary key here is a combination of {PackageID, TagNumber}

**Part Two:**

4.

PackageID	SoftwarePackage	TagNumber	CompModel	SoftwareCostUSD	InstallDate
AC01	Zork	32808	Apple	754.95	09-13-2005
DB32	Spotify	32808	Apple	380.00	12-03-2005
DB32	Spotify	37691	Dell	380.00	06-15-2005
DB33	Word	57772	HP	412.77	05-27-2005
WP08	Adobe	32808	Apple	185.00	01-12-2006
WP08	Adobe	37691	Dell	227.50	06-15-2005
WP08	Adobe	57222	Asus	170.24	05-27-2005
WP09	Portal	59836	Lenovo	35.00	10-30-2005
WP09	Portal	77740	Toshiba	35.00	05-27-2005

5. Functional dependencies:

- PackageID → SoftwarePackage
- TagNumber → CompModel
- PackageID, TagNumber → SoftwareCostUSD, InstallDate

6. All the attributes in this table are not dependent on the primary key thus not making it possible for this to be a third normal form. Also this table does not follow 2NF, so it cannot be in 3NF.

### Part Three:

7. Primary keys:

- a. PackageID
- b. TagNumber
- c. PackageID, TagNumber

a.

PackageTypes	
PackageID	SoftwarePackage
AC01	Zork
DB32	Spotify
DB33	Word
WP08	Adobe
WP09	Portal

b.

ModelPricing	
TagNumber	CompModel
32808	Apple
37691	Dell
57222	Asus
57772	HP
59836	Lenovo
77740	Toshiba

c.

FinalInstall			
PackageID	TagNumber	SoftwareCostUSD	InstallDate
AC01	32808	754.95	09-13-2005
DB32	32808	380.00	12-03-2005
DB32	37691	380.00	06-15-2005
DB33	57772	412.77	05-27-2005
WP08	32808	185.00	01-12-2006
WP08	37691	227.50	06-15-2005
WP08	57222	170.24	05-27-2005
WP09	59836	35.00	10-30-2005
WP09	77740	35.00	05-27-2005

8. Functional Dependencies:

- a. PackageID → SoftwarePackage
- b. TagNumber → CompModel
- c. PackageID, TagNumber → SoftwareCostUSD, InstallDate

9. The tables are in 3NF because now each table follows 2NF since all the partial dependencies have been fixed. This makes the table 3NF also because there are no multi-key dependencies that exist and the values of each given field are atomic.

10. E/R Diagram:

