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Normalization 1
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Part One:

I would say "the spreadsheet has lots of duplicate data and we should try to rename columns better. If someone looked at this they wouldn't necessarily know that TagNumber means the computer. Let's try to organize this better so it is self-explanatory and more efficient."

PackageID	TagNumber	InstallDate	SoftwarePriceUSD
AC01	32808	09-13-2005	754.00
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

The primary key is a combination of the PackageID and TagNumber.

Part Two:

PackageID	TagNumber	InstallDate	SoftwarePriceUSD	SoftwarePackageName	ComputerModel
AC01	32808	09-13-2005	754.00	Zork	Dell
DB32	32808	12-03-2005	380.00	Portal	Dell
DB32	37691	06-15-2005	380.00	Portal	Apple
DB33	57772	05-27-2005	412.77	Adobe	Apple
WP08	32808	01-12-2006	185.00	Microsoft Word	Dell
WP08	37691	06-15-2005	227.50	Microsoft Word	HP
WP08	57222	05-27-2005	170.24	Microsoft Word	Lenovo
WP09	59836	10-30-2005	35.00	Microsoft Excel	HP
WP09	77740	05-27-2005	35.00	Microsoft Excel	HP

PackageID -> SoftwarePackageName
TagNumber -> ComputerModel
InstallDate -> SoftwarePriceUSD
(PackageID, TagNumber) -> PackageID
(PackageID, TagNumber) -> TagNumber
(PackageID, TagNumber) -> InstallDate
(PackageID, TagNumber) -> SoftwarePriceUSD

(PackageID, TagNumber) -> SoftwarePackageName

(PackageID, TagNumber) -> ComputerModel

This is not in third Normal Form because there are multiple key dependencies in non-key attributes. The first two dependencies should not exist in the same table as the rest of the dependencies. In this table, SoftwarePackageName is dependent on PackageID which is dependent on (PackageID, TagNumber). This is a multiple key dependency and it proves that this table is not in third Normal Form.

Part Three:

Installations

PackageID	TagNumber	InstallDate	SoftwarePriceUSD
AC01	32808	09-13-2005	754.00
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

Primary Key:

(PackageID, TagNumber)

Dependencies:

(PackageID, TagNumber) -> PackageID

(PackageID, TagNumber) -> TagNumber

(PackageID, TagNumber) -> InstallDate

(PackageID, TagNumber) -> SoftwarePriceUSD

ComputerModels

TagNumber	ComputerModel
32808	Dell
37691	Apple
57772	Apple
57222	Lenovo
59836	HP
77740	HP

Primary Key:

TagNumber

Dependencies:

TagNumber -> ComputerModel

SoftwarePackages

PackageID	SoftwarePackageName
AC01	Zork
DB32	Portal
DB33	Adobe
WP08	MicrosoftWord
WP09	Microsoft Excel

Primary Key:

PackageID

Dependencies:

PackageID -> SoftwarePackageName

These tables are in third Normal Form because they are in second Normal Form and there are no multiple key dependencies in non-key attributes. In all of these tables attributes depend on the key, the whole key and nothing but the key.

