

1. There are a lot of problems at first glance with this data. There are empty spaces in some of the columns and that is never good to have. In order to fix that we might create an insert anomaly in adding more data then we have to make an entry or we might have an update anomaly if two rows have some of the same data we will have to update them both when that data changes. There also is no uniqueness to a lot of the data. The IDs and TagNumber aren't very descriptive and we can't really tell what they represent.

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

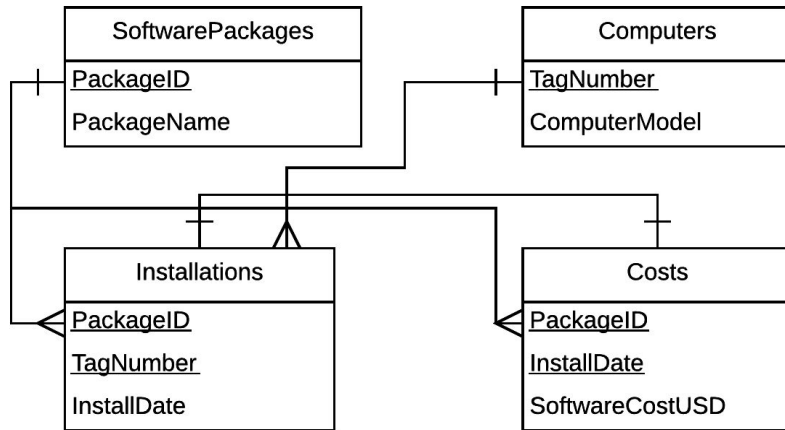
3. The Primary Key is a composite key of PackageID and TagNumber.

4.

PackageID	TagNumber	PackageName	Computer Model	InstallDate	SoftwareCost USD
AC01	32808	Microsoft Office	Apple	09-13-2005	754.95
DB32	32808	Adobe Photoshop	Apple	12-03-2005	380.00
DB32	37691	Adobe Photoshop	IBM	06-15-2005	380.00
DB33	57772	Microsoft Word	Lenovo	05-27-2005	412.77
WP08	32808	GoogleChrome	Apple	01-12-2006	185.00
WP08	37691	GoogleChrome	IBM	06-15-2005	227.50
WP08	57222	GoogleChrome	Lenovo	05-27-2005	170.24
WP09	59836	Spotify	Samsung	10-30-2005	35.00
WP09	77740	Spotify	Toshiba	05-27-2005	35.00

5. PackageID → PackageName, InstallDate, SoftwareCostUSD
TagNumber → ComputerModel
6. This table is not in third normal form because it has multiple dependencies. The SoftwareCostUSD depends on InstallDate since the price of the software changes depending on the date it was installed.
7. SoftwarePackages PK: PackageID
Computers PK: TagNumber
Installations PK: PackageID, TagNumber
Costs PK: PackageID, InstallDate
8. SoftwarePackages: PackageID → PackageName
Computers: TagNumber → ComputerModel
Installations: PackageID, TagNumber → InstallDate
Costs: PackageID, InstallDate → SoftwareCostUSD
9. The new tables are in 3rd normal form now because no multiple dependencies exist. The problem we had earlier with SoftwareCostUSD and InstallDate is fixed because we have separate entities for that data.

10.



SoftwarePackages		Computers	
<u>PackageID</u>	PackageName	<u>TagNumber</u>	ComputerModel
AC01	Microsoft Office	32808	Apple
DB32	Adobe Photoshop	37691	IBM
DB33	Microsoft Word	57772	Lenovo
WP08	Google Chrome	57222	Lenovo
WP09	Spotify	59836	Samsung
		77740	Toshiba

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