

Normalization Homework 1

Database Management

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Part One:

1. The PackageID and TagNumbers go to many different software packages. This means that it would be difficult to isolate one package based solely on a PackageID and on a TagNumber.
2. 1NF

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. Primary Key (PackageID, TagNumber)

Part Two:

1. Add 2 columns – one for software package name, one for computer model

PackageID	TagNumber	InstallDate	SoftwareCostUSD	SoftwarePackage	CompModel
AC01	32808	09-13-2005	754.95	Portal	HP
DB32	32808	12-03-2005	380.00	Zeta	HP
DB32	37691	06-15-2005	380.00	Zeta	Apple
DB33	57772	05-27-2005	412.77	Omega	Dell
WP08	32808	01-12-2006	185.00	Alpha	HP
WP08	37691	06-15-2005	227.50	Alpha	Apple
WP08	57222	05-27-2005	170.24	Alpha	Gateway
WP09	59836	10-30-2005	35.00	Beta	Lenovo
WP09	77740	05-27-2005	35.00	Beta	Acer

2. Functional Dependencies: TagNumber -> CompModel
PackageID -> SoftwarePackage
PackageID, TagNumber -> SoftwareCostUSD
3. This table is not 3rd normal form because there are multiple key dependency, the primary key could be (PackageID, TagNumber) or it could be (TagNumber, SoftwarePackage) or (CompModel, SoftwarePackage) or (PackageID, CompModel). There is also a partial key dependency.

Part Three: Decompose 1NF table to set of 3NF tables

Packages

PackageID	SoftwarePackage
AC01	Portal
DB32	Zeta
DB33	Omega
WP08	Alpha
WP09	Beta

Computers

TagNumber	CompModel
32808	HP
37691	Apple
57772	Dell
57222	Gateway
59836	Lenovo
77740	Acer

Installations

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

1. Packages Primary Key: PackageID
Computers Primary Key: TagNumber
Installations Primary Key: (PackageID, TagNumber)
2. Packages: PackageID -> SoftwarePackage
Computers: TagNumber -> CompModel
Installations: PackageID, TagNumber -> SoftwareCostUSD
3. These tables are in 3rd normal form because there are no partial key or multiple key dependencies. The PackageID is the primary key of Packages because there is no guarantee that future Software Package names will be unique, where as the PackageID will be unique. The same is for TagNumber, the Computer Models might not be unique, and therefore TagNumber is the primary key. The Installations table uses a composite key of its two foreign keys, PackageID and TagNumber, as its primary key and there are no partial key dependencies in it.
4. E-R diagram:

