

Robert Mitola

Professor Labouseur

Database Management

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Normalization Homework 1

Part 1

1. I would inform Meservy that elements in his spread sheet should be atomic. Currently there are multiple entries for each column corresponding to the primary key, Package ID or Tag Number. I would suggest normalizing the table so that each entry is atomic.
- 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 Package ID and Tag Number.

Part 2

- 1.

PackageID	TagNumber	InstallDate	SoftwareCostUSD	SoftwarePackageName	ComputerModel
AC01	32808	09-13-2005	754.95	Zork	Apple
DB32	32808	12-03-2005	380.00	Portal	Apple
DB32	37691	06-15-2005	380.00	Portal	HP
DB33	57772	05-27-2005	412.77	Age of Empires	Dell
WP08	32808	01-12-2006	185.00	Microsoft Word	Apple
WP08	37691	06-15-2005	227.50	Microsoft Word	HP
WP08	57222	05-27-2005	170.24	Microsoft Word	Dell
WP09	59836	10-30-2005	35.00	Gubble	Gateway
WP09	77740	05-27-2005	35.00	Gubble	Raspberry Pi

2. PackageID → SoftwarePackageName
 TagNumber → ComputerModel
 PackageID, TagNumber → InstallDate, SoftwareCostUSD

3. The table is not in third normal form because there are attributes that are not dependent on every candidate key in the table. There are multiple primary keys. The primary keys are TagNumber and PackageID. However, SoftwarePackageName is only dependent on PackageID and ComputerModel is only dependent on TagNumber. In order to be in third normal form, both these attributes would have to be dependent on both keys.

Part 3

Software Packages			
PackageID	SoftwarePackageName		
AC01	Zork		
DB32	Portal		
DB32	Portal		
DB33	Age of Empires		
WP08	Microsoft Word		
WP08	Microsoft Word		
WP08	Microsoft Word		
WP09	Gubble		
WP09	Gubble		
Computers			
TagNumber	ComputerModel		
32808	Apple		
32808	Apple		
37691	HP		
57772	Dell		
32808	Apple		
37691	HP		
57222	Dell		
59836	Gateway		
77740	Raspberry Pi		
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	5-27-2005	35.00

1. The primary key for the Software Packages table is PackageID. The primary key for the Computers table is TagNumber. Lastly. The primary key for the Installations table is PackageID and TagNumber as a composite key.
2. Functional Dependencies for Software packages Table:
PackageID → SoftwarePackageName
Computers Table:
TagNumber → ComputerModel
Installations Table:
PackageID, TagNumber → InstallDate, SoftwareCostUSD
3. The tables are in third normal form since the attributes in each table depend entirely on the specified primary keys. No partial primary keys or multiple primary key instances exist.
- 4.

