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Lab 7: Normalization Lab 1
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Part One: KramERICA CEO Miles Meservy has put together a spreadsheet of all the data he has so far, which he personally collected.

1. As he shows you the spreadsheet, having just signed your consulting agreement, he asks what you think of it. How do you reply?

I would say that it's a good idea that he kept track of the data and that I can "format" it to give better access to data.

2. Put his data in 1NF and display it. (Show me the table; no SQL.)

PackID	TagNum	InstallMonth	InstallDay	InstallYear	SoftwareCost
AC01	32808	09	13	1995	754.95
DB32	32808	12	03	1995	380.00
DB32	37691	06	15	1995	380.00
DB33	57772	05	27	1995	412.77
WP08	32808	01	12	1996	185.00
WP08	37691	06	15	1995	227.50
WP08	57222	05	27	1995	170.24
WP09	59836	10	30	1995	35.00
WP09	77740	05	27	1995	35.00

3. What is the primary key?

PackID, TagNum. I would try to suggest having TagNum unique (that's what we do at my job for Marist).

Part Two: Add two columns of new data: one for software package name (e.g., Zork, Portal, etc.) and one for computer model (e.g., HP, Apple, etc.). Be sure that your new data is consistent with the original data. Do not add any additional columns.

4. Display the new table.

PackID	PackName	TagNum	CompModel	InstallMonth	InstallDay	InstallYear	SoftwareCost
AC01	Zork	32808	HP	09	13	1995	754.95
DB32	Portal	32808	HP	12	03	1995	380.00
DB32	Portal	37691	Apple	06	15	1995	380.00
DB33	Brawl	57772	Microsoft	05	27	1995	412.77
WP08	Towerfall	32808	HP	01	12	1996	185.00
WP08	Towerfall	37691	Apple	06	15	1995	227.50
WP08	Towerfall	57222	Alienware	05	27	1995	170.24

WP09	Mario	59836	Dell	10	30	1995	35.00
WP09	Mario	77740	Sony	05	27	1995	35.00

5. Identify and document all the functional dependencies.

PackID gives functional dependence to PackName. TagNum gives functional dependence to CompModel. The primary key, PackID, TagNum, gives functional dependence to the other columns, InstallMonth, InstallDay, InstallYear, and SoftwareCost.

6. Explain why this new table is **not** in third normal form.

This new table is not in third normal form because of PackName having partial key dependence PackID and not TagNum. This violates second normal form, which violates third as it must satisfy second as well.

Part Three: Decompose your 1NF table into a set of tables that are in at least third normal form. (BCNF would be better). Remember that it's wrong to add artificial keys to associative entities.

Package		Computer	
PackID	PackName	TagNum	CompModel
AC01	Zork	32808	HP
DB32	Portal	32808	HP
DB32	Portal	37691	Apple
DB33	Brawl	57772	Microsoft
WP08	Towerfall	32808	HP
WP08	Towerfall	37691	Apple
WP08	Towerfall	57222	Alienware
WP09	Mario	59836	Dell
WP09	Mario	77740	Sony

Install					
PackID	TagNum	InstallMonth	InstallDay	InstallYear	SoftwareCost
AC01	32808	09	13	1995	754.95
DB32	32808	12	03	1995	380.00
DB32	37691	06	15	1995	380.00
DB33	57772	05	27	1995	412.77
WP08	32808	01	12	1996	185.00
WP08	37691	06	15	1995	227.50
WP08	57222	05	27	1995	170.24
WP09	59836	10	30	1995	35.00
WP09	77740	05	27	1995	35.00

7. Identify all primary keys (determinants) for all tables.

Package has PackID as its primary key. Computer has TagNum as its primary key. Install has PackID, TagNum as its (composite) primary key.

8. Identify all functional dependencies for all tables.

PackID gives functional dependence to PackName in the Package table. TagNum gives functional dependence to CompModel in the Computer table. The primary key, PackID, TagNum, gives functional dependence to the other columns, InstallMonth, InstallDay, InstallYear, and SoftwareCost in the Install table.

9. Explain why the new tables are in third normal form.

The new tables are in third normal form because they do not contain any partial key dependencies and do not contain any non-key column dependencies on other non-key columns.

10. Draw a beautiful E/R diagram.

