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Database Systems Lab 7  
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1. I would say that the structure of the data needs to be seriously reworked.

2. Spreadsheet in 1NF:

PackID	TagNum	InstallDate	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	170.24
WP08	57222	05-27-1995	170.24
WP09	59836	10-30-1995	35.00
WP09	77740	05-27-1995	35.00

3. The primary key is TagNum

4. New table with two additional columns:

PackID	TagNum	InstallDate	SoftwareCost	PackName	CompModel
AC01	32808	09-13-1995	754.95	Zork	Apple
DB32	32808	12-03-1995	380.00	Portal	Apple
DB32	37691	06-15-1995	380.00	Portal	HP
DB33	57772	05-27-1995	412.77	Portal 2	Dell
WP08	32808	01-12-1996	185.00	Eclipse	Apple
WP08	37691	06-15-1995	227.50	Eclipse	HP
WP08	57222	05-27-1995	170.24	Eclipse	Alienware
WP09	59836	10-30-1995	35.00	Paint	Toshiba
WP09	77740	05-27-1995	35.00	Paint	IBM

5. Functional Dependencies:

TagNum → CompModel

PackID → PackName

6. This table is not in 3NF because it is not in 2NF (still lots of redundant data) and columns are not dependent on a single key.

**Packages**

<u>PackID</u>	PackName
AC01	Zork
DB32	Portal
DB33	Portal 2
WP08	Eclipse
WP09	Paint

**Computers**

<u>TagNum</u>	CompModel
32808	Apple
37691	HP
57772	Dell
57222	Alienware
59836	Toshiba
77740	IBM

**Installations**

<u>PackID</u>	<u>TagNum</u>	InstallDate	SoftwareCostUSD
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. Primary Keys

Packages Table: PackID

Computers Table: TagNum

Installations Table: PackID, TagNum

## 8. Functional Dependencies

Packages Table: PackID → PackName

Computers Table: TagNum → CompModel

Installations Table: PackID, TagNum → InstallDate, SoftwareCostUSD

9. The new tables are in 3NF because it is in 1NF(all data is atomic), in 2NF(no partial dependencies), and there are no multiple key dependencies.

10.

