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Lab 7

1) **Tycho CEO Fred Johnson has put together a spreadsheet of all the data he has so far, which he personally collected.**
   a. At first, I reply by straight up lying to him to his face and telling him that it is a great start. Then I'll let him down slowly by telling him all of the things that are wrong. I will tell him that the table is not in 1NF, and explain that he must not group the PackageIDs as he did. I'll show him my results below.
   b.

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	227.00
WP08	57222	05-27-2005	170.24
WP09	59536	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

   c. Primary key is PackageID and TagNumber, making a composite key.

2) **Add two columns of new data: one column for software package name and one for computer model. Be sure that your new data is consistent with the original data. Do not add any additional columns.**
   a.

Package ID	Tag Number	Install Date	Software CostUSD	Software Pack	Comp Model
AC01	32808	09-13-2005	754.95	Clip Studio	Dell
DB32	32808	12-03-2005	380.00	Paint Tool SAI	Dell
DB32	37691	06-15-2005	380.00	Paint Tool SAI	Lenovo
DB33	57772	05-27-2005	412.77	Illustrator	Macintosh
WP08	32808	01-12-2006	185.00	SketchPad	Dell
WP08	37691	06-15-2005	227.00	SketchPad	Lenovo
WP08	57222	05-27-2005	170.24	SketchPad	Macintosh
WP09	59536	10-30-2005	35.00	AutoDesk Pro	Sony
WP09	77740	05-27-2005	35.00	AutoDesk Pro	Acer

   b. (PackageID, TagNumber) |→ InstallDate, SoftwareCostUSD, SoftwarePack, CompModel
   c. It is not in 3NF because it is not in 2NF. PackageID and TagNumber are combined to make the primary key.

3) **Decompose your 1NF table into a set of tables that are in at least 3NF. Remember that it's wrong to add artificial keys to associative entities.**

Installation >

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	227.00
WP08	57222	05-27-2005	170.24
WP09	59536	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

< Software

Package ID	Software Pack
AC01	Clip Studio
DB32	Paint Tool SAI
DB32	Paint Tool SAI
DB33	Illustrator
WP08	SketchPad
WP08	SketchPad
WP08	SketchPad
WP09	AutoDesk Pro
WP09	AutoDesk Pro

< Computer

Tag Number	Comp Model
32808	Dell
32808	Dell
37691	Lenovo
57772	Macintosh
32808	Dell
37691	Lenovo
57222	Macintosh
59536	Sony
77740	Acer

a. First table primary key is (PackageID, TagNumber). Second table primary key is PackageID and third table primary key is TagNumber.

b. First table is (PackageID, TagNumber) |→ InstallDate, SoftwareCostUSD. Second table is PackageID |→ SoftwarePack. Third is TagNumber |→ CompModel.

c. Each table has their own primary key that have functional dependencies. None of the tables have partial key or multiple key dependencies. This is 3NF.

d.