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### Lab 7: Normalization One

#### Part 1:

- 1) The first thing that I notice about this spreadsheet is that it is not 1NF. Some data under the PackageID column has been left blank. There is also no primary key that is specified and I believe that no single row could be a primary key because there are repeat instances of every row in the table of data.
- 2)

	packageid character(4)	tagnumber character(5)	installdate text	softwarecostusd numeric(5,2)
1	AC01	32808	09/13/05	754.95
2	DB32	32808	12/03/05	380.00
3	DB32	37691	06/15/05	380.00
4	DB33	57772	05/27/05	412.77
5	WP08	32808	01/12/06	185.00
6	WP08	37691	06/15/05	227.50
7	WP08	57222	05/27/02	170.24
8	WP09	59836	09/20/05	35.00
9	WP09	77740	09/21/05	35.00

- 3) There is only one way to identify a primary key and that is to use a composite key made from PackageID and TagNumber

#### Part 2:

- 4)

	packageid character(4)	tagnumber character(5)	installdate text	softwarecostusd numeric(5,2)	packagename text	computermodel text
1	AC01	32808	09/13/05	754.95	Alpha	Microsoft
2	DB32	32808	12/03/05	380.00	Beta	Microsoft
3	DB32	37691	06/15/05	380.00	Beta	Dell
4	DB33	57772	05/27/05	412.77	Delta	Alienware
5	WP08	32808	01/12/06	185.00	Epsilon	Microsoft
6	WP08	37691	06/15/05	227.50	Epsilon	Lenovo
7	WP08	57222	05/27/02	170.24	Epsilon	Google
8	WP09	59836	09/20/05	35.00	Phi	Asus
9	WP09	77740	09/21/05	35.00	Phu	Gateway

5) The functional dependencies for the table are:

TagNumber -> Computer Model

PackageID -> PackageName

PackageID , TagNumber -> InstallDate , SoftwareCostUSD

6)

The table is not in 3NF because there is more than dependency. 3NF requires that all attributes of the table depend on a single primary key.

7)

tagnumber character(5)	computermodel text
32808	Microsoft
32808	Microsoft
37691	Dell
57772	Alienware
32808	Microsoft
37691	Lenovo
57222	Google
59836	Asus
77740	Gateway

Above is the 'Computers' Table. The Primary Key for this table would be TagNumber

packageid character(4)	installdate text	packagename text
AC01	09/13/05	Alpha
DB32	12/03/05	Beta
DB32	06/15/05	Beta
DB33	05/27/05	Delta
WP08	01/12/06	Epsilon
WP08	06/15/05	Epsilon
WP08	05/27/02	Epsilon
WP09	09/20/05	Phi
WP09	09/21/05	Phu

Above is the table for 'Software Packages'. The Primary key for this table would be PackageID

packagename	tagnumber	softwarecostusd
text	character(5)	numeric(5,2)
Alpha	32808	754.95
Beta	32808	380.00
Beta	37691	380.00
Delta	57772	412.77
Epsilon	32808	185.00
Epsilon	37691	227.50
Epsilon	57222	170.24
Phi	59836	35.00
Phu	77740	35.00

Above is the 'Costs' table. The Primary key be the PackageName

8)

Computer Models

TagNumber -> ComputerModel

Software Packages

PackageID -> PackageName

Costs

PackageName , TagNumber -> SoftwareCostUSD

9)

These new tables are in 3NF because they all only have one functional dependency on their primary key

10)

