

## Normalization HW #1

### Part One

1. Respond to the CEO with something positive, such as saying his spreadsheet is a great start for the database design and add that, as a database consultant, you can improve upon it.

2. 1NF table

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 a composite key, using columns PackageID, TagNumber, and InstallDate.

### Part Two

1. Table

PackageID	PackageName	TagNumber	TagModel	InstallDate	SoftwareCostUSD
AC01	Lotus Notes	32808	HP	09-13-2005	754.95
DB32	Portal	32808	HP	12-03-2005	380.00
DB32	Portal	37691	Apple	06-15-2005	380.00
DB33	Portal 2	57772	Lenovo	05-27-2005	412.77
WP08	Windows 7	32808	HP	01-12-2006	185.00
WP08	Windows 7	37691	Apple	06-15-2005	227.50
WP08	Windows 7	57222	Sony	05-27-2005	170.24
WP09	Windows 8.1	59836	Sony	10-30-2005	35.00
WP09	Windows 8.1	77740	Microsoft	05-27-2005	35.00

2. Functional dependencies:

- PackageID → PackageName
- TagNumber → TagModel
- PackageID, TagNumber → InstallDate
- PackageID, TagNumber, InstallDate → SoftwareCostUSD

- Some attributes are not dependent on the composite primary key in the table (PackageID, TagNumber, InstallDate). For instance, PackageName is dependent on PackageID, but it is not dependent on TagNumber and InstallDate, meaning it is not dependent to the key as a whole. Same goes for TagModel, which is not dependent on PackageID and InstallDate.

### Part Three

- Primary key(s):
  - Packages table – PackageID
  - Installations table – PackageID, TagNumber, InstallDate
  - Tags table – TagNumber
- Functional dependencies:
  - Packages table
    - PackageID → PackageName
  - Installations table
    - PackageID, TagNumber, InstallDate → SoftwareCostUSD
  - Tags table
    - TagNumber → TagModel
- The new tables are in 3NF, because the attributes in every table are only dependent to its table's whole key, and nothing but the key (there is no multiple key dependency). So help me, Codd.
- ER diagram

