Piradon (Tien) Liengtiraphan
Database Management
2016-03-28

Part One

1. As he shows you the spreadsheet, having just signed your consulting agreement, he asks what you think of it. How do you reply?
    a. The amount of data that you have collected speaks volumes about the dedication your company has to good bookkeeping. All this information is important and I appreciate the fact that you have so meticulously collected it. The next step will be to format the data so that it is more modular and allows for a smoother transition into a new framework for Database Management.

Part 01: First Normal Form			
PackageID	**TagNumber**	**InstallDate**	**SoftwareCostUSD**
AC01	32808	09-13-05	754.95
DB32	32808	12-03-05	380.00
DB32	37691	06-15-05	380.00
DB33	57772	05-27-05	412.77
WP08	32808	01-12-06	185.00
WP08	37691	06-15-05	227.50
WP08	57222	05-27-05	170.24
WP09	59836	10-30-05	35.00
WP09	77740	05-27-05	35.00

2.
3. What is the primary key?
    a. The Primary Key for this form the the table is a composite key created by combining the values located in PackageID and TagNumber

Part Two

4.

Part 02: New Table					
PackageID	**TagNumber**	**ComputerModel**	**PackageName**	**InstallDate**	**SoftwareCostUSD**
AC01	32808	IBM	Zork	09-13-05	754.95
DB32	32808	IBM	pgSQL	12-03-05	380.00
DB32	37691	Apple	pgAQL	06-15-05	380.00
DB33	57772	MSI	mySQL	05-27-05	412.77
WP08	32808	IBM	Portal	01-12-06	185.00
WP08	37691	Apple	Portal	06-15-05	227.50
WP08	57222	Dell	Portal	05-27-05	170.24
WP09	59836	Lenovo	ZenMap	10-30-05	35.00
WP09	77740	Asus	ZenMap	05-27-05	35.00

5. Identify and document all functional dependencies.
    a. PackageID → PackageName, SoftwareCost
    b. TagNumber → Computer Model
    c. PackageID/TagNumber → Install Date
6. Explain why this new table is not in third normal form.
    a. First and foremost, currently the table is not even in second normal form. A table is considered in third normal form if and only if it is in second normal form and all attributes in the table are determined by the candidate key. This table fails both those conditions and the second condition of second normal form - no non prime attribute is dependant on any proper subset of any candidate key of the table. (Not everything can be determined by the current candidate keys, only by compositing.)

Part Three

7. Identify all primary keys (determinants) for all tables.
    a. Software Table PKey → PackageID
    b. Installation Table PKey → PackageID + TagNumber
    c. Devices Table PKey → TagNumber
8. Identify all functional dependencies for all tables.
    a. Software Table
        i. PackageID → PackageName, SoftwareCost
    b. Devices Table
        i. TagNumber → Computer Model
    c. Installation Table
        i. PackageID/TagNumber → Install Date
9. The new tables are in third normal form because it reduces the chance for duplicate data and also ensures referential integrity between the existing tables. All the strong entities (e.g. Software & Devices) have attributes which are determined by candidate keys and not by non-prime attributes. The weak entity's (e.g. Installation) attributes are denounced by a composite key made up of the primary keys of the Software and the Devices table. The current table is also in second normal form which extended means the table is also in first normal form. This is because no non-prime attribute is dependent on a subset of any candidate key in the table. By organizing the data in this format, and using a data management tool like pgAdmin we can ensure referential integrity and eliminate the need to input what could be considered to be duplicate data.

Software

PackageID	PackageName	SoftwareCostUSD
AC01	Zork	754.95
DB32	pgSQL	380.00
DB33	mySQL	412.77
WP08	Portal	185.00
WP09	ZenMap	35.00

Installation

PackageID	TagNumber	InstallDate
AC01	32808	09-13-05
DB32	32808	12-03-05
DB32	37691	06-15-05
DB33	57772	05-27-05
WP08	32808	01-12-06
WP08	37691	06-15-05
WP08	57222	05-27-05
WP09	59836	10-30-05
WP09	77740	05-27-05

Devices

TagNumber	ComputerModel
32808	IBM
37691	Apple
57772	MSI
57222	Dell
59836	Lenovo
77740	Asus

10.