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CMPT 308
Normalization Homework 1
October 27, 2008

Part One

1. You did a great job with starting the spreadsheet, but it can be improved on and made better. Normalization can be introduced to help organize the data in a clearer, more concise way. Redundancy and dependency will be reduced because of this, and the spreadsheet will become much easier to understand.

2.

PackageID (PK) Char(4)	TagNumber (PK) Int	InstallDate Date	SoftwareCostUSD Numeric
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. For this table, the primary key is a composite key of the PackageID and the TagNumber.

Part Two

1.

PackageID (PK) Char(4)	TagNumber (PK) Int	InstallDate date	SoftwareCostUSD numeric	Software PackageName	Computer Model
AC01	32808	09-13-2005	754.95	Faster Than Light	HP
DB32	32808	12-03-2005	380.00	Portal	HP
DB32	37691	06-15-2005	380.00	Portal	Apple
DB33	57772	05-27-2005	412.77	Half-Life 3	Dell
WP08	32808	01-12-2006	185.00	World of Warcraft	HP
WP08	37691	06-15-2005	227.50	World of Warcraft	Apple
WP08	57222	05-27-2005	170.24	World of Warcraft	Asus
WP09	59836	10-30-2005	35.00	Diablo II	Acer
WP09	77740	05-27-2005	35.00	Diablo II	Toshiba

2. Functional Dependencies

- PackageID → Software PackageName
- TagNumber → Computer Model
- PackageID and TagNumber → InstallDate and SoftwareCostUSD

3. This table is not in third normal form, because to be in third normal form all columns need to be dependent on both primary keys. However, in this table SoftwarePackageName is dependent on PackageID, but not on TagNumber. Also, Computer Model is dependent on TagNumber, but not on PackageID. In order to be in Third Normal Form the dependency needs to be on both, but in this case it is not.

Part Three

1. Computer, Software, and Installation will be the three new tables created to decompose the 1NF table into 3NF.

- The primary key of the Computers table will be the TagNumber.
- The primary key of the Software table will be the PackageID.
- The primary key of the Installations table will be the composite key of PackageID and TagNumber.

2.

- Software Table: PackageID → Software PackageName
- Computer Table: TagNumber → Computer Model
- Installation Table: PackageID and TagNumber → InstallDate and SoftwareCostUSD

3. The new tables are in third normal form, because all elements in each table are dependent upon the primary keys of those tables; there are no multiple key dependencies inside the table. As an example, TagNumber is dependent to only Computer Model, PackageID is dependent to only Software PackageName and both PackageID and TagNumber are dependent to InstallDate and SoftwareCostUSD.

4.

