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Database Management
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Normalization I

Part One:

1. All thought the spreadsheet avoids listing the PackageID multiple times, for what I assume is efficiency purposes, it creates null values if you were to separate each installation, which is required to protect data integrity. The table also does not possess a primary key that uniquely defines each row. Yes, each row is unique in at least one or more columns, but there is no single primary key that can be used to identify a specific row for navigation purposes.
2. 1NF

PackageID	TagNumber	InstallDate	SoftwareCostUSD
ACO1	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	57772	05-27-2005	170.24
WP09	59836	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

3. The first normal form states that each field of data must be atomic in value. All though there are multiple PackageIDs for numerous TagNumbers there is data redundancy because of the first normal form.

Part Two:

4.

TagNumber	CompModel	PackageID	SoftwareName	InstallDate	SoftwareCostUSD
32808	Apple	ACO1	Adobe	09-13-2005	754.95
32808	Apple	DB32	Dreamweaver	12-03-2005	380.00
32808	Apple	WP08	Word	01-12-2006	185.00
37691	IBM	DB32	Dreamweaver	06-15-2005	380.00
37691	IBM	WP08	Word	06-15-2005	227.50
57772	HP	DB33	Filezilla	05-27-2005	412.77
57772	HP	WP08	Word	05-27-2005	170.24
59836	Lenovo	WP09	Chrome	10-30-2005	35.00
77740	Samsung	WP09	Chrome	05-27-2005	35.00

5. Functional dependencies:
    a. TagNumber → CompModel
    b. PackageID → SoftwareName
    c. PackageID, SoftwareName, InstallDate →SoftwareCostUSD
6. This new table is not in third normal form as it only satisfies the first normal form. It needs to satisfy both the first and second normal form to be considered as possibly being in third normal form. According to the second normal form, there must be no partial dependency upon the primary key, but this table does not have a primary key, that uniquely defines each row.

Part Three:

TagNumber	CompModel
32808	Apple
37691	IBM
57772	HP
59836	Lenovo
77740	Samsung

PackageID	SoftwareName
AC01	Adobe
DB32	Dreamweaver
DB33	Filezilla
WP08	Word
WP09	Chrome

TagNumber	PackageID	InstallDate	SoftwareCostUSD
32808	ACO1	09-13-2005	754.95
32808	DB32	12-03-2005	380.00
32808	WP08	01-12-2006	185.00
37691	DB32	06-15-2005	380.00
37691	WP08	06-15-2005	227.50
57772	DB33	05-27-2005	412.77
57772	WP08	05-27-2005	170.24
59836	WP09	10-30-2005	35.00
77740	WP09	05-27-2005	35.00

7. Identify all primary keys (determinants) for all tables.
   Top Right Table
   Primary Key: TagNumber
   Functional Dependencies: TagNumber → CompModel
   Top Left Table
   Primary Key: PackageID
   Functional Dependencies: PackageID → SoftwareName
   Bottom Table
   Primary Key: TagNumber, PackageID
   Functional Dependencies: TagNumber, PackageID → InstallDate, SoftwareCostUSD
8. Identify all functional dependencies for all tables
   TagNumber → CompModel
   PackageID → SoftwareName
   TagNumber, PackageID → InstallDate, SoftwareCostUSD
9. Explain why the new tables are in third normal form
   The new tables are in third normal form because they satisfy the first two normal forms, all fields are atomic and there are no partial dependencies. To satisfy the third normal form each table must be dependent upon their primary key.

10. Draw a beautiful E/R diagram