Lab 7 - Normalization 1

Part1

1. “Well Mr. Johnson I can definitely work with this. You have all the right data and it’s formatted well for general purpose viewing. However, for something like a database it does have a few key flaws. Due to the nature of relational databases data must be stored in first normal form, which this spreadsheet does not currently do, but that's an easy fix. Because it is not in first normal form, it is consequently not in second or third normal form, all three of which should be enforced at all times. Not to worry we can work with this data and put it into the database in no time at all.

2.

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	05-27-2007	170.24
WP09	59836	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

3. The primary key is the combination of both the PackageID and TagNumber. The combination of the two is the only less than three key combination that results in a unique set.

Part2

4.

PackageID	TagNumber	InstallDate	SoftwareCostUSD	PackageName	CompModel
AC01	32808	09-13-2005	754.95	Portal	Apple
DB32	32808	12-03-2005	380.00	Half-Life	Apple
DB32	37691	06-15-2005	380.00	Half-Life	Lenovo
DB33	57772	05-27-2005	412.77	Half-Life 2	Dell
WP08	32808	01-12-2006	185.00	Half-Life 2 E1	Apple
WP08	37691	06-15-2005	227.50	Half-Life 2 E1	Lenovo
WP08	57222	05-27-2007	170.24	Half-Life 2 E1	HP
WP09	59836	10-30-2005	35.00	Half-Life 2 E2	Apple
WP09	77740	05-27-2005	35.00	Half-Life 2 E2	Acer

5. Functional Dependencies:
    a. SoftwareCostUSD is dependent on the primary key (PackageID+TagNumber) as well as CompModel
    b. PackageName is dependent on the PackageID
    c. CompModel is dependent on the TagNumber
    d. InstallDate is dependent on the primary key (PackageID+TagNumber)

6. This is not in third normal form because third normal form requires the table to first be in second normal form. Second normal form states that the table must have no partial key dependencies. In this table we have two separate partial key dependencies with TagNumber and CompModel as well as PackageID and PackageName both of which do not rely on specifically the primary key (PackageID+TagNumber)

Part3

Computers

TagNumber	CompModel
32808	Apple
37691	Lenovo
57772	Dell
57222	HP
59836	Apple
77740	Acer

Software

PackageID	PackageName
AC01	Portal
DB32	Half-Life
DB33	Half-Life 2
WP08	Half-Life 2 E1
WP09	Half-Life 2 E2

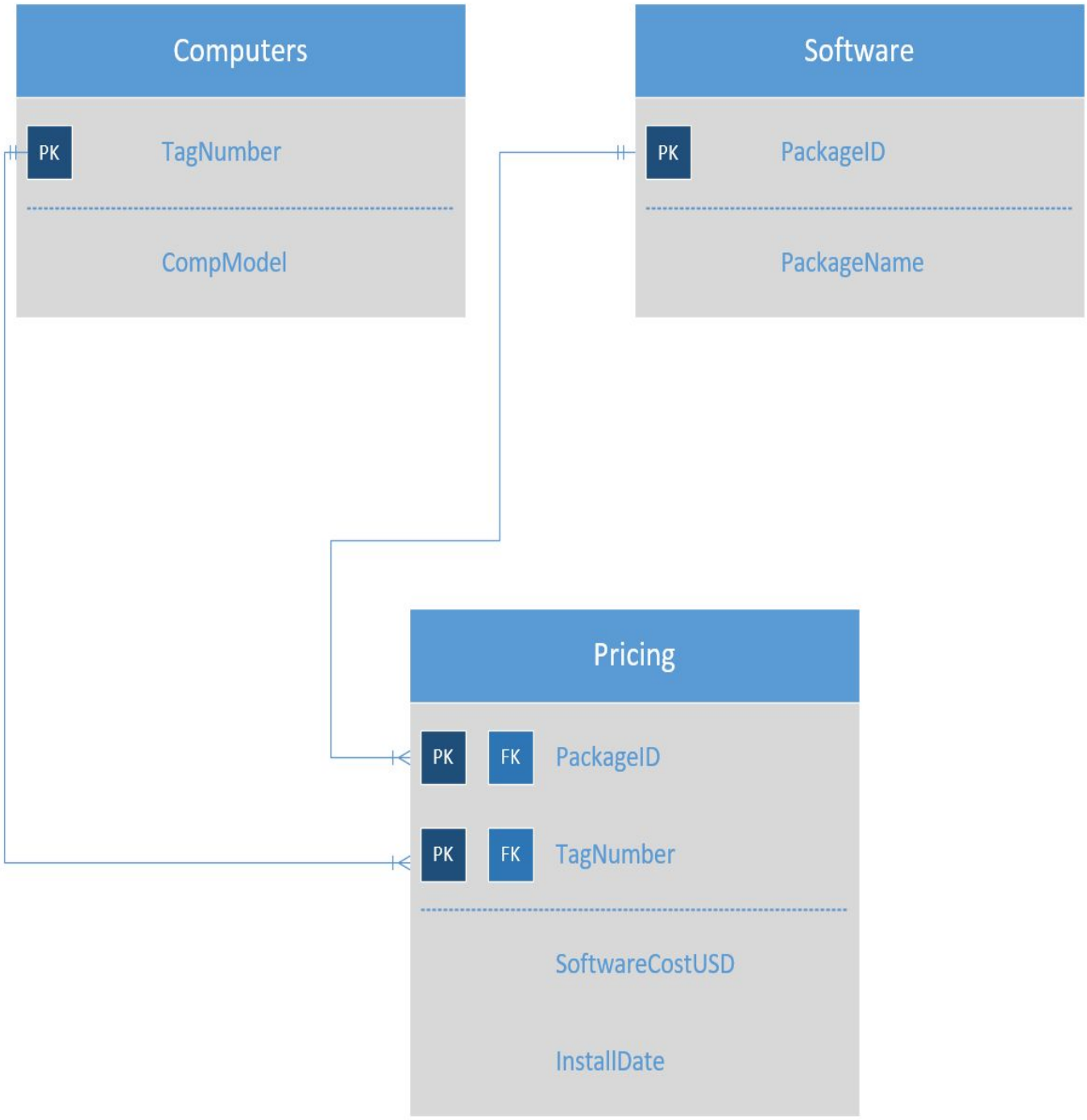
Pricing

PackageID	TagNumber	SoftwareCostUSD	InstallDate
AC01	32808	754.95	09-13-2005
DB32	32808	380.00	12-03-2005
DB32	37691	380.00	06-15-2005
DB33	57772	412.77	05-27-2005
WP08	32808	185.00	01-12-2006
WP08	37691	227.50	06-15-2005
WP08	57222	170.24	05-27-2007
WP09	59836	35.00	10-30-2005
WP09	77740	35.00	05-27-2005

7. Primary Keys:
    a. Computers
        i. TagNumber
    b. Software
        i. PackageID
    c. Pricing
        i. PackageID+TagNumber

8. Functional Dependencies
    a. Computers
        i. CompModel depends on the primary key (TagNumber)
    b. Software
        i. PackageName depends on the primary key (PackageID)
    c. Pricing
        i. SoftwareCostUSD depends on the primary key (PackageID+TagNumber)
        ii. InstallDate depends on the primary key (PackageID+TagNumber)
9. These new tables are in third normal form because they all directly depend on JUST the primary key and nothing else. There are no transitive dependencies between one or more of the tuples. And we removed the partial key dependencies seen in question 6.

10.


Computers
PK
TagNumber
CompModel
Software
PK
PackageID
PackageName
Pricing
PK
FK
PackageID
PK
FK
TagNumber
SoftwareCostUSD
InstallDate