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1. *As he shows you the spreadsheet, having just signed your consulting agreement, he asks what you think of it. How do you reply?*

The actual Spreadsheet isn't terrible, it could be worse, but It isn't Ideal. Some good points are that each cell seems to be atomic; and that things like SoftwareCostUSD do specify what currency it is in, while things like InstallDate Would use a Date Format. However, There should not be a single Row for each PackageID, there should be multiple; two DB32 Rows instead of One Row with entries for all columns twice.

2. *Put his data in 1NF and display it. (Show me the table; no SQL.)*

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. *What is the Primary Key?*

For this Table, A good Primary Key would be PackageID + TagNumber, as it would be able to uniquely Identify A Row.

*Part Two: **Add two columns of new data**: one column for software package name (e.g., Zork, Portal, etc.) and one for computer model (e.g., IBM, Apple, etc.). Be sure that your new data is consistent with the original data. **Do not add any additional columns.***

It says to add two columns without adding any additional columns. I believe the intended meaning is no other columns other than the two specified? Otherwise, I don't see how you can add columns without adding columns.

4. *Display The New Table*

PackageID	TagNumber	InstallDate	SoftwareCost USD	Software PackageName	Computer Model
AC01	32808	09-13-2005	754.95	Adobe Connect	SUN Microsystems
DB32	32808	12-03-2005	380.00	Oracle Database	SUN Microsystems
DB32	37691	06-15-2005	380.00	Oracle Database	Dell
DB33	57772	05-27-2005	412.77	IBM DB2	IBM
WP08	32808	01-12-2006	185.00	Word Perfect Standard	SUN Microsystems
WP08	37691	06-15-2005	227.50	Word Perfect Standard	Dell
WP08	57222	05-27-2005	170.24	Word Perfect Standard	Apple
WP09	59836	10-30-2005	35.00	Word Perfect Professional	Hewlett Packard
WP09	77740	05-27-2005	35.00	Word Perfect Professional	Samsung

5. *Identify and document all functional dependencies.*

Dependencies: ComputerModel is Dependent on TagNumber, as TagNumber specifies a unique Computer; that computer will always have the same computer model in all rows. Likewise, SoftwarePackageName is dependent on PackageID; A single PackageID will always have the same SoftwarePackageName. As a result, SoftwarePackageName will always be determined by PackageID. In addition, the SoftwareCostUSD is the cost at the InstallDate, and therefore, the SoftwareCostUSD is not entire Dependent on InstallDate, but is affected by it; a package like WP08 has different Prices based on the Date.

6. *Explain why this new table is not in third normal form.*

This Table has issues where certain columns are dependent on others, and not all the attributes in the table are determined by only candidate keys; the price is based on the date and the pakage ID; where the Date is not part of a candidate key

Decompose your 1NF table into a set of tables that are in at least third normal form. (BCNF would be better.) Remember that it's wrong to add artificial keys to associative entities. Actually, as I said before, do not add any additional columns.

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
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WP08	57222	05-27-2005	170.24
WP09	59836	10-30-2005	35.00
WP09	77740	05-27-2005	35.00

PackageID	SoftwarePackageName
AC01	Adobe Connect
DB32	Oracle Database
DB33	IBM DB2
WP08	Word Perfect Standard
WP09	Word Perfect Professional

TagNumber	ComputerModel
32808	SUN Microsystems
37691	Dell
57772	IBM
57222	Apple
59836	Hewlett Packard
77740	Samsung

7. *Identify all primary keys*

      Primary Keys are: PackageID, and TagNumber

8. *Identify all functional dependencies for all tables*

      Dependencies for SoftwarePackageName on PackageID, ComputerModel on TagNumber, and CostUSD on PackageID and InstallDate

9. *Explain why new Tables are in Third Normal Form*

      Because they are in first normal form, atomic, they are in second normal form, there are no partial Key dependencies, and additionally, all attributes are determined only by candidate keys.

10. *ER diagram*