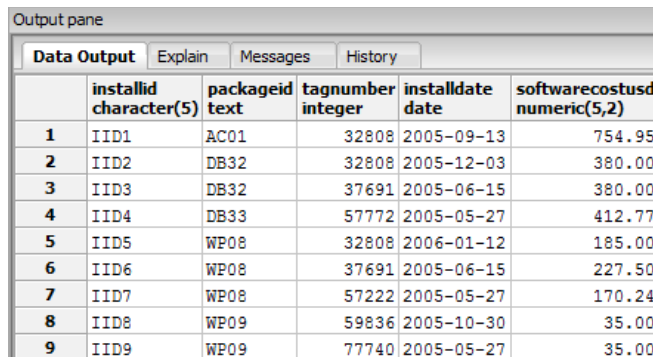Michael O'Rourke
Lab 7:

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?

Mr. Meservy from looking at this data gathered there is an issue with the TagNumber column. There is duplicating entities on many of the packageID's. A way to get around this would be to use a primary key to uniquely identify each of the software installs to increase speed of access. Instead of needing to check two attributes to find one result, you only would have to look at one. Alternatively, re-tag your existing software with unique tags for each so they do not conflict with one another and use this scheme for future updates to your software. If you wish to keep this system you can instead implement a composite key method which would be used to uniquely identify an install.

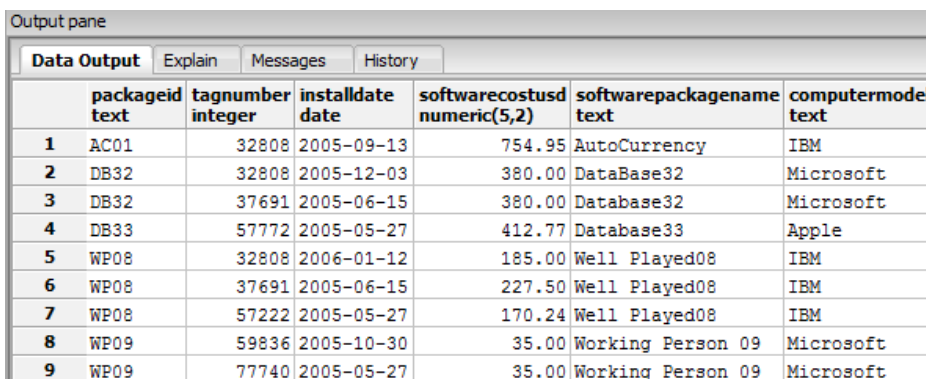2. Put his data in 1NF and display it. (Show me the table; no SQL.)

Output pane

	installid character(5)	packageid text	tagnumber integer	installdate date	softwarecostusd numeric(5,2)
1	IID1	AC01	32808	2005-09-13	754.95
2	IID2	DB32	32808	2005-12-03	380.00
3	IID3	DB32	37691	2005-06-15	380.00
4	IID4	DB33	57772	2005-05-27	412.77
5	IID5	WP08	32808	2006-01-12	185.00
6	IID6	WP08	37691	2005-06-15	227.50
7	IID7	WP08	57222	2005-05-27	170.24
8	IID8	WP09	59836	2005-10-30	35.00
9	IID9	WP09	77740	2005-05-27	35.00

3. What is the primary key?

The primary key is InstallID (IID) which was added because there was no primary key in Mr. Meservy's table beforehand and thus was confusing and resulted in duplicating data in addition to being annoying to look at.

Part two:
4. Display the new table.

Output pane

	packageid text	tagnumber integer	installdate date	softwarecostusd numeric(5,2)	softwarepackagename text	computermodel text
1	AC01	32808	2005-09-13	754.95	AutoCurrency	IBM
2	DB32	32808	2005-12-03	380.00	DataBase32	Microsoft
3	DB32	37691	2005-06-15	380.00	Database32	Microsoft
4	DB33	57772	2005-05-27	412.77	Database33	Apple
5	WP08	32808	2006-01-12	185.00	Well Played08	IBM
6	WP08	37691	2005-06-15	227.50	Well Played08	IBM
7	WP08	57222	2005-05-27	170.24	Well Played08	IBM
8	WP09	59836	2005-10-30	35.00	Working Person 09	Microsoft
9	WP09	77740	2005-05-27	35.00	Working Person 09	Microsoft

5. Identify and document all functional dependencies.

ComputerModel is dependent on PackageID. Additionally, the software package name is dependent on PackageID. Cost is dependent on PackageID/TagNumber as a composite entity. Date is also dependent on PackageID/TagNumber.

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

This table is not in 3NF because there is an abundance of trivial functional dependency. The dependencies can be broken into multiple tables to increase functionality and visual quality. An example of this is the software package and computermodel are dependent only on packageID.

Part three:

Installs table:

	packageid text	tagnumber integer	installdate date
1	AC01	32808	2005-09-13
2	DB32	32808	2005-12-03
3	DB32	37691	2005-06-15
4	DB33	57772	2005-05-27
5	WP08	32808	2006-01-12
6	WP08	37691	2005-06-15
7	WP08	57222	2005-05-27
8	WP09	59836	2005-10-30
9	WP09	77740	2005-05-27

Prices Table:

	packageid character(5)	tagnumber integer	prices numeric(5,2)
1	AC01	32808	754.95
2	DB32	32808	380.00
3	DB32	37691	380.00
4	BD33	57772	412.77
5	WP08	32808	185.00
6	WP08	37691	227.50
7	WP08	57222	170.24
8	WP09	59836	35.00
9	WP09	77740	35.00

Packages Table:

	packageid character(5)	softwarepackagename text	computermodel text
1	AC01	AutoCurrency	IBM
2	DB32	DataBase32	Microsoft
3	DB33	Database33	Apple
4	WP08	Well Played08	IBM
5	WP09	Working Person 09	Microsoft

7. Identify all primary keys (determinants) for all tables.

The primary key for the installs table is a composite key of packageID and TagNumber.
The primary key for the prices table is a composite key of packageID and TagNumber as well.
The primary key for the packages table is just packageID.

8. Identify all functional dependencies for all tables.

The install tables has date dependent on the composite key of packageID and TagNumber.
The install tables has price dependent on the composite key of packageID and TagNumber.
The install tables has softwarepackagename and computermodel dependent on the primary key of packageID.

9. Explain why the new tables are in third normal form.

The new tables are in 3NF because they follow both 1NF and 2NF as well are split into separate tables for their dependent entities to remove trivial dependencies.

10. Draw a beautiful E/R diagram