CS130 Practice Problems for the Final

Work through as many of the following problems as possible.

1) Create a folder on your desktop called **PUNetIDFinalReview** using your PUNetID.

Problem #1:

Create a professional looking PowerPoint presentation called **Problem1.ppt** with each of the following slides. For each Excel file or SPSS file needed, give the file a descriptive name and place in your folder.

Slide 1: For a random number of selected homes sold in Washington County, the annual tax amount (in thousands of dollars) and selling price (in thousands of dollars) are as follows. For Slide 1, create a title slide stating the problem.

Slide 2: Show the data that you will be using to answer the questions.

```
Taxes:  4.0  2.4  1.8  1.5  1.4  1.4  3.0  1.9
Selling
Price:  265  142  114  160  130  150  228  145
```

Slide 3: Perform a Linear Regression on the above data using Excel and paste in your results.

Slide 4: Perform a Linear Regression on the above data using SPSS and paste in your results.

Slide 5: Using the equation editor, show the linear equation and R-squared value produced by performing the Linear Regression.

Slide 6: For an annual tax amount of $2,450, what might we expect the selling price of this house to be? State the problem and show the answer. Use the equation editor to show the equation.

Slide 7: For a selling price of $235,000, what might we expect the taxes to be for this house? State the problem and show the answer. Use the equation editor to show the equation.

Problem #2:

Create a professional looking PowerPoint presentation called **Problem2.ppt** with each of the following slides:

Consider the following two cold medicines tested for acetaminophen.

Test the claim that the mean amount of acetaminophen is the same for both medicines. What is your conclusion? Explain. In particular, state your NULL Hypothesis, perform the appropriate Hypothesis test, state your conclusion.

```
Brand A  472  487  506  512  489  503  511  501  495  504  494  462
Brand B  562  512  523  528  554  513  516  510  524  510  524  508
```

Slide 1: State the problem and show the data.

Slide2: Explain what Hypothesis test you will be using to solve the problem.

Slide3: State the Null Hypothesis.

Slide4: Perform the proper Hypothesis test and paste in the results.

Slide5: State your conclusion and reasoning for your conclusion.

Problem #3:

It is often the case that bacterial cultures, confined to a petri dish, will grow quite rapidly until the amount of bacteria approaches a critical value. Given the formula for bacteria growth as $P(t) = 7.74e^{0.143t}$ where P is the amount of bacteria present at time t hours later. Create a worksheet that allows the user to input a time and that reports the amount of bacteria present at that particular time. Create a comment (right click on a cell and choose Insert Comment) that shows the number of bacteria that can be expected at time t=1000. The comment is to be placed and displayed in cell A5. Next, in a separate worksheet, create a table listing the size of the population at t=0, t=5, t=10, ... through t=250. Finally, take the table data into SPSS and create a graph showing the results. Make sure the graph is completely and properly labeled.

Problem #4:

The NCAA is considering ways of speeding up the end of college basketball games. In a recent NCAA tournament, the last two minutes of 60 games took the following times to complete (in seconds):

756	587	929	871	378	503	564	1128	693	748
448	670	1023	335	540	853	852	495	666	474
443	325	514	404	820	915	793	778	627	483
861	337	292	1070	625	457	676	494	420	862
991	615	609	723	794	447	704	396	235	552
626	688	506	700	240	363	860	670	396	345

Note: Data was reported in USA Today

a) In both Excel and SPSS, find the mean, median, mode, standard deviation, minimum, and maximum values for the given data. Paste these results into a Word document.

b) Create a histogram of the given data.

c) Do these times indicate that something should be done to speed up the last two minutes of the game? Support your answer as best you can.