Social Dilemmas   **T-test   Lab**

Introduction:

In this Lab you will learn how to use Excel to conduct a t-test for paired samples. The t-test is used to compare the means of two different samples. This is similar to the type of test you will be doing for your project.

To conduct a t-test for paired data with Excel do the following:

- Beside the two columns containing the paired data values, create a new column containing the difference between each of your paired data values, $D=X_1-X_2$.
- Next evaluate the average value of D, the standard deviation, the standard error.
- With these values calculate t statistic.
- To evaluate the probability value, p, for that value of t use the Excel function called TDIST$(t,deg\_freedom,tails)$ in a new cell. This function gives the probability for a particular value of $t,$ and it takes three inputs: t is the t statistic, $deg\_freedom$ is the degrees of freedom, and $tails$ is either 1 or 2 depending on whether you are doing a one or two tailed test. Typically if the probability is less than 0.05 we reject the null hypothesis and accept the research hypothesis.

Note: When you are doing your project you will probably be doing an unpaired t-test. In which case you may use the Excel function TTEST.

- The syntax for TTEST is TTEST ($array\_1, array\_2, tails, type$), where $array\_1$ and $array\_2$ are the columns with your two data sets, $tails$ is the desired number of distribution tails (1 or 2), and $type$ is the type of t-test to perform. A type of 1 indicates a paired t-test, a type of 2 is a two-sample equal variance t-test and a type of 3 indicates a two-sample unequal variance t-test. If in doubt use 3.

Procedure:

1. First complete a t-test for the paired data from the previous lab. You should compare the means of the time spent choosing between two dissimilar or two similar shapes. Make your hypothesis be that students spend longer distinguishing similar shapes than dissimilar shapes. You should each analyze your own samples. In case you do not have your original data, the data is in the file EasyHard.xls (in the lab section of our website and the handouts section of the Social Dilemmas section of the ORCA server in the CAL).
2. Now visit the website and play the repeated prisoner's dilemma http://www.gametheory.net/Web/PDilemma/. You should choose your

strategy in order to earn the maximum number of points. Play all five rounds and then record your total payoff and your opponent's total payoff on the following web form: http://spreadsheets.google.com/viewform?hl=en&formkey=dHBfVVNYYzlMaVZwc1VkWWZ4V0dOZ2c6MA

3. The data from the web form will be posted in the lab section of our website in the file repeated_pd.xls. Open this file, and perform a t-test comparing the means of the student scores and the opponents score. Is there a significant difference between the scores of the students and their opponents?

4. Visit the Predictably Irrational Website and complete the Confidence Level demonstration: http://www.predictablyirrational.com/?page_id=228 . How successful were you in predicting your own confidence levels?

5. Log on to the Games and Behavior Website and complete the three interactive games. You will play these against an anonymous member of the class: Record your score for each game on your excel spread sheet
http://gametheory.tau.ac.il/twoPlayers/g1003/default.asp
http://gametheory.tau.ac.il/twoPlayers/g1004/default.asp
http://gametheory.tau.ac.il/twoPlayers/g1005/default.asp

Assignment: (Due December 2nd)

1. Complete a second draft of your mini-paper from the previous lab. Make sure you include statistical comparisons of the data sets and a labeled histogram of the two different samples, if you did not do that the first time. In addition, this time in the introduction include an appropriate hypothesis about the times taken to complete the two different kinds of tasks. In your analysis make use of your t-test to reject or accept the alternative hypothesis and state a conclusion about the times taken to choose between two similar or two dissimilar shapes.

2. Upload your excel spreadsheet to the program moodle site. Your spreadsheet should include the work you did in the lab and the answers to the questions asked.