Computer Lab Project No. 8

Hypothesis Testing

Today's topic is hypothesis testing. Here is the general procedure, very similar to the calculation of confidence intervals. The built-in hypothesis tests of StatCrunch use the P-value method instead of the critical value method.

1. Start StatCrunch.
2. If you want to test a hypothesis concerning a given sample, then load it into StatCrunch.
3. Click on "Stat" in the menu bar.
4. If you want to use the t-distribution for the hypothesis test, then choose "T statistics" in the submenu, and if you want to use the normal distribution, then choose "Z statistics". These choices apply if you want to test hypotheses concerning the mean of a population, with σ unknown or known. If you want to test a hypotheses about a proportion of a population, choose "Proportions".
5. In the next submenu, choose "One sample", "Two sample" or "Paired" (only in the T-statistics submenu).
6. In the following submenu, choose either "with data" or "with summary". Note that the test statistic depends only on the sample mean, the sample size and the standard deviation (either of the sample or of the population). If you choose "with summary", you'll have to enter these values, instead of providing the entire sample.
7. If you chose "with data", then you'll have to select the column(s) that contain(s) the data in the next popup window. You can ignore the other text fields and click "Next>".
8. Choose "Hypothesis Test" (this is the default), enter the desired significance level and the null hypothesis, and choose the relation symbol in the alternative hypothesis.
9. If you wish, you can check the box "Store output in data table".
10. Click "Compute!".

Here is what you can work on today. When testing, always use significance level 0.05.

1. Test the claim that a proportion is 0.6, given a data sample of 40 successes among 100 trials, with the alternative hypothesis that the proportion is not 0.6.
2. Load the data set *Body Data* into the StatCrunch table. Test the claim that the mean body temperature is less than 98.6 degrees.
3. Test the hypothesis that the mean female pulse rate is less than the mean male pulse rate, using two-sample t-statistics. Compare to the confidence intervals for these rates that you calculated last time. Remember, you can focus on the male/female population by using the "where" condition GENDER = 0/1.