Math 160/263 Minitab Assignment # 10 - Windows Version

Chapter 5 - Introduction to Inference

Worksheet Name - data10.MTW

1. A brewery filling machine is adjusted to fill quart bottles with a mean of 32.0 ounces of ale and a standard deviation of 0.05 ounce. In order to determine whether the machine is working properly, a quality-control engineer measured the contents of 20 randomly selected bottles. The results are given in data10.MTW.

   (a) Use the **Stat > Basic Statistics > 1-Sample Z** menu command to find a 90% confidence interval for the mean contents of all bottles of ale filled by the machine.

   (b) Is there significant evidence at the 10% level that the mean contents of the bottles is not 32.0 ounces? State hypotheses and base a test on the confidence interval from (a).

2. Sulpher compounds cause "off-odors" in wine, so oenologists (wine experts) have determined the odor threshold, the lowest concentration of a compound that the human nose can detect. For example, the odor threshold for dimethyl sulfide (DMS) is given in the oenology literature as 25 micrograms per liter of wine (μg/l). Untrained noses may be less sensitive, however. The DMS odor thresholds for 10 beginning students of oenology are given below. Assume that the standard deviation of the odor threshold for untrained noses is known to be $\sigma = 7\mu$g/l.

   Is there convincing evidence that the mean odor threshold for beginning students is higher than the published threshold, 25 μg/l? Use the **Stat > Basic Statistics > 1-Sample Z** menu command to carry out the significance test.

3. The Stanford-Binet "IQ test" is adjusted so that the scores for each age group of children are approximately normally distributed with mean 100 and standard deviation 15.

   (a) Use the **Calc > Random Data > Normal** menu command to simulate 50 scores on the "IQ test" in each of 20 columns of the worksheet.

   (b) Use the **Stat > Basic Statistics > 1-Sample Z** menu command to carry out a test of the null hypothesis that $\mu = 100$ for each of the 20 samples of scores on the "IQ test". How many times is the null hypothesis rejected at the 5% level? How many times is the null hypothesis rejected at the 1% level?