HOMEWORK: STATISTICAL INFERENCE
The One-Sample t DISTRIBUTION

PROBLEM 1:
A company manufactures bars of soap that are supposed to weigh exactly (on average) 10 ounces. A sample is taken:

        n=20
        $\overline{X}$ = 10.20 oz
        s = 0.80 oz

(a) Test at α = .05
(b) Construct a 95% CIE of μ

PROBLEM 2:
The Momoland Springs Company claims that at most there are 1 ppm (parts per million) of benzene in their water. Test at α=.05
Data:
n=25
$\overline{X}$ = 1.16 ppm
s = .20 ppm

PROBLEM 3:
A company claims that cancer patients using drug X will live at least 10 more years.

        n=16
        $\overline{X}$ = 8.8 year
        s = 3.4 year

Test at α=.05

PROBLEM 4:
A company manufactures wind turbines. A random sample of 25 turbines is taken and the sample mean life is 20.00 years with a standard deviation of 2.50 years. If you were constructing a 95% two-sided confidence interval estimate, the upper limit would be:

PROBLEM 5:
You want to estimate the average life of a new kind of computer chip. You take a sample of 16 chips and find the sample mean to be 12.50 years with a sample standard deviation of .80 years. You construct a 99% two-sided confidence interval estimate. It is:

PROBLEM 6:

A yogurt company claims that its yogurt ice cream has no more than 2.0 mgs. of fat. You sample 25 cups of yogurt and find that the sample mean is 2.10 milligrams and the sample standard deviation is .40 milligrams
   (a) Test the claim at the .05 significance level
   (b) No claim was made by the company. They took a sample with the above results and want to construct a two-sided 95% confidence interval for the population mean. The upper limit of the confidence interval is:

PROBLEM 7:

A school claims that the average English regents score of its students is at least 80. You sample 16 students and find that the sample mean is 76 and the sample standard deviation is 12
   (a) Test the claim at the .05 significance level
   (b) No claim was made by the school. They took a sample with the above results and want to construct a two-sided 95% confidence interval for the population mean. The upper limit of the confidence interval is:

PROBLEM 8:

An LSAT preparation school claims that its review course will add at least 50 points to the score of a student retaking the LSAT exam. You sample 25 students and find that average improvement was 40 points with a standard deviation of 15 points
   (a) Test the claim at the .05 significance level
   (b) No claim was made by the school. They took a sample with the above results and ask you to construct a two-sided 95% confidence interval for the population mean.

PROBLEM 9:

A drug company that manufactures a diet drug claims that those using the drug for 30 days will lose at least 15 pounds. You sample 30 people who have used the drug and find that the average weight loss was 12 pounds with a standard deviation of 5 pounds.
(a) Test the claim at the .05 significance level. (b) No claim was made by the company. They took a sample with the above results and ask you to construct a two-sided 95% confidence interval for the population mean.