MAT 135, Discussion Questions 4.15

1. For each of the situations below, determine the method you would use for finding the confidence interval (you can label the methods by the calculator function if you wish).
   a. IQ scores are distributed normally with a mean of 100 and a standard deviation of 15. A sample of 20 students produced a mean IQ of 104.

Z Interval $\sigma = 15$, $\bar{x} = 104$, $n = 20$, C-level: .95 (97.426, 110.57)

   b. A survey of 35 adults found that the mean age people would like to live to is 87.9 years with a standard deviation of 15.5.

T-Interval $\bar{x} = 87.9$, $S_x = 15.5$, $n = 35$, C-level: .95 (82.576, 93.224)

   c. A researcher wanted to determine the mean number of hours watched per week by the typical person. The researcher interviewed 50 people and found a mean of 16.3 hours with a standard deviation of 2.2 hours.

Either T-Interval better default (15.675, 16.925)

$\bar{x} = 16.3$, C-level: .95, $S_x = 2.2$, $n = 50$

   d. A beer brewer makes beer that averages 6.4% alcohol by volume with a standard deviation of 0.5%. They sample 75 bottles of beer and find a sample mean of 6.3% alcohol by volume.

Z-Interval Stats $\sigma = .5$, $\bar{x} = 6.3$, $n = 75$ (6.1868, 6.4132)

   e. Alan wants to estimate the proportion of people who walk to work. In a survey of 400 adults, he finds 16 who walk to work.

1 PropZ Int $x = 16$, $n = 400$, C-level: .95 (.0208, .0592)

   f. A Rasmussen poll of 1000 adults found that 18% dreaded the holiday.

1 PropZ Int $x = 180$, $n = 1000$, C-level: .95 (.15619, .20381)

2. For each of the situations above, find the 95% confidence interval using your chosen method.

See above

3. Do any of the confidence intervals yield results that are problematic?

doesn't seem like it

4. Interpret each interval in a complete English sentence in the context of the situation.

a. based on the data, the true mean IQ is between 97 and 111 w/ 95% confidence,

b. The true mean age people would like to live to is between 82.6 and 93.2 years w/ 95% confidence.

c. we are 95% sure that the true mean number of hours of TV watched per week is between 15.7 and 16.9 hours.

d. we are 95% sure that the true mean alcohol content of beer (at this brewery) is between 6.2% and 6.4%.

e. we are 95% confident that the true proportion of people who walk to work is between 2% and 6%.

f. we are 95% certain that the true proportion of people who hate the holiday is between 15.6% and 20.4%.