Stat 140 - Quiz 5

What's Your Name? _____

This is a sample quiz. On the real quiz, I will pick a different example of inference for a population proportion, and ask a subset of 3 or 4 of the questions below.

Garden Seeds

A garden center wants to store leftover packets of vegetable seeds for sale the following spring, but the center is concerned that the seeds may not germinate at the same rate a year later.

The manager randomly selects 200 seeds from a variety of packets from different companies and different batches of seeds, and plants them. She carefully prepares similar soil for the seeds in a greenhouse, and randomizes where the seeds are planted within the greenhouse. She finds that 171 of the 200 test seeds grew. The seed packets all claimed that 95% of the seeds would grow.

In answering the questions below, use the following output from R:

```
binom.test(x = 171, n = 200, p = 0.95)
```

```
##
##  Exact binomial test
##
## data:  171 and 200
## number of successes = 171, number of trials = 200, p-value =
## 2.948e-07
## alternative hypothesis: true probability of success is not equal to 0.95
## 95 percent confidence interval:
##  0.7984385 0.9006914
## sample estimates:
## probability of success
##                  0.855
```

1) Describe the population parameter in a sentence. What symbol would you use for the population parameter?

2) Describe the sample statistic in a sentence. What symbol would you use for the sample statistic?

3) Is the number $171/200 = 0.855$ a sample statistic or a population parameter?

4) Suppose the manager wants to conduct a hypothesis test of whether the old seeds germinate at the advertised rate. Write down the null and alternative hypotheses for this test.

5) Check the conditions for performing inference about the population parameter based on the sample data.

6) Draw a conclusion for the hypothesis test at the $\alpha = 0.05$ significance level. Explain/justify your answer. You do not need to define or interpret the p-value as a part of this explanation.

7) State a 95% confidence interval in the context of this problem. You do not need to explain what the phrase "95% confident" means as part of your answer.

8) In your answer to part 6, what does the phrase "95% confident" mean?