Chapter 5 HW

Problem 28

a) Is there substantial evidence (alpha = .01) that the additive reduces the mean absorption from its current value?

Hypotheses:

- H_0: mu = 35
- H_A: mu < 35

Test Statistic:

- z = (y_hat - mu)/(sigma/sqrt(n))

```
## [1] "My test statistic is z =-1.076"
```

P-value:

```
require(BSDA)
sample <- rep(33.6, times = 50)
test <- z.test(x = sample, sigma.x = 9.2, alternative = "less", mu = 35, conf.level = 0.99)
```

Conclusion:

Because our p-value(0.141) > 0.01, there is *not* sufficient evidence to reject the null hypothesis that the mean absorption rate = 35 units. The data from the sample do *not* provide enough proof at the 99% level that the additive brings down the mean absorption rate.

b) What is the level of significance of your test results?

```
## [1] "My p-value from my test was 0.141"
```

d) Estimate the mean absorption using a 99% confidence interval. Is the confidence interval consistent with your conclusions from the hypothesis test?

Confidence Interval

```
## [1] "My Confidence Interval at the 99% level is between (30.5732 and 36.6268)"
```

Conclusion

Since my y-hat sits between the two values of my confidence interval, this method backs up my hypothesis.

Problem 41

a) Place a 95% confidence on the mean dissolved oxygen level during the 2-month period.

```
## [1] "My confidence interval at 95% is between (4.6379 and 5.2621)"
```

b) Using the confidence interval from part (a), does the mean oxygen level appear to be less than 5 ppm?

Conclusion:

Since our confidence interval *included* 5 in the interval, it does not appear, at the 95% level, the mean is less than 5 ppm.

c) Test the research hypothesis that the mean oxygen level is less than 5 ppm. What is the level of significance of your test? Interpret your findings.

Hypotheses:

- H_0 : mu = 5 ppm
- H_A : mu < 5 ppm
- Test at the 95% Level (5% level of significance/alpha)

Test Statistic

```
## [1] "My test statistic is z = -0.314"
```

P-value

```
## [1] "My p-value is 0.3768"
```

Conclusion

Since my p-value is greater than 0.05, there is *not* significant evidence to reject the null hypothesis that mu = 5 ppm. Thus, there is not sufficient evidence that the mean oxygen level is less than 5 ppm.