Homework 11

1. There's enough evidence to support the claim that the diameter mean exceeds 8.25 mm.

2.

$$\boxed{t = \frac{\bar{X} - \mu}{s/\sqrt{n}}}$$

3. Step 1: State the hypotheses and identify the claim.

H0 : mean <= 8.25 mm and H1 : mean > 8.25 mm.

Step 2: Find the critical value.

Alpha = 0.05, then t = +1.65

Step 3: Compute the test value.

Mean = 8.234, Variance = 0.00064, SD = 0.0252982,

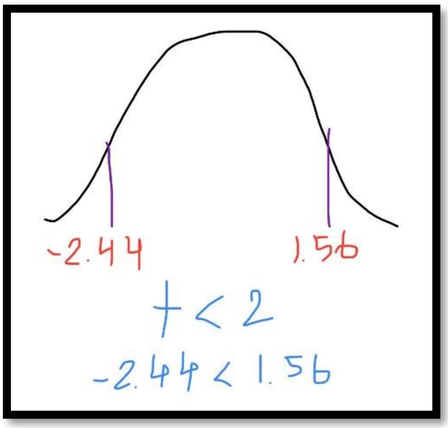
t = (8.234 – 8.25) / (0.0252982 / √15) = -2.44949

Step 4: Make a decision.

Since the test value (-2.44949) is less than the critical value (1.65), the decision is not to reject the H0.

Step 5: Summarize the result.

There is enough evidence to support the claim that that diameter mean exceeds 8.25 mm.



4.

```
        One Sample t-test

data:  diameter
t = -2.4495, df = 14, p-value = 0.986
alternative hypothesis: true mean is greater than 8.25
95 percent confidence interval:
 8.222495      Inf
sample estimates:
mean of x
    8.234
```

Code:

```r
# HW 11 Hypothesis Testing
# 65011304 Inthat Sappipat

# Data
diameter <- c(8.24, 8.25, 8.20, 8.23, 8.24, 8.21, 8.26, 8.26, 8.20,
              8.25, 8.23, 8.23, 8.19, 8.28, 8.24)
cat(mean(diameter))
cat(var(diameter))

# Using t.test built-in function
result <- t.test(diameter, mu = 8.25, alternative = "greater")

# Print the result
print(result)
```

Conclusion:

From the experiment, I find the means whether it exceeds 8.25 mm or not using the 5 steps of the process to summarize the conclusion. Also, I have used the R built-in function which is t.test to check the result to confirm the correctness of my result using 5 steps. In my opinion, both methods lead to the same conclusion, whether I perform my own number crunching or utilize the t.test function. It appears that there isn't much of a difference in the mean diameter based on the negative t-statistic (t = -2.44).