R Markdown Yahriel Salinas-Reyes HW 2

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# Question 1

## 1. State the Ho, Ha Hypothesis

Null hypothesis (Ho): The dietary supplement has no effect on blood pressure. That is, the mean blood pressure after taking the supplement is the same as before (mu\_before=mu\_after)

Alternative hypothesis (Ha): The dietary supplement reduces blood pressure. That is, the mean blood pressure after taking the supplement is less than before. (mu\_before > mu\_after)

## Q1.2.

# Blood pressure before taking the supplement  
before <- c(130, 125, 140, 135, 138, 132, 137, 142, 129, 136, 133, 139, 140, 150)  
# Blood pressure after taking the supplement for 8 weeks  
after <- c(122, 118, 133, 127, 129, 124, 130, 135, 121, 128, 126, 132, 120, 123)  
  
# Run a paired t-test  
t\_test\_result <- t.test(after, before, paired = TRUE, alternative = "less")

## Q1.3

# View the results  
print(t\_test\_result)

##   
## Paired t-test  
##   
## data: after and before  
## t = -6.1753, df = 13, p-value = 1.674e-05  
## alternative hypothesis: true mean difference is less than 0  
## 95 percent confidence interval:  
## -Inf -7.030364  
## sample estimates:  
## mean difference   
## -9.857143

Based on the Output, we get the following results

t-statistic = -6.1753 Degrees of freedom (df) = 13 p-value = .00001674 95% CI for the difference in means: (-INF, -7.030364)

## Q1.4

# If the Ho is true, the probability of having a statistic as extreme as -6.1753 or more extreme, is .001674%.

# Since the value of Ho is outside of the 95% interval # we reject the null hypothesis.

# We conclude that there is a significant reduction in blood pressure after taking the dietary supplement.

# Question 2

# Question 3

# Question 4

# Question 5

# Question 6

# Question 7

# Question 8

# Question 9