

Part 2 – Forearm Length

This histogram represents the forearm length, in inches, of 140 males who were randomly selected. The histogram provides visual evidence of normal distribution due to its symmetrical and mounded shape with the center of data landing just over 18.6 which is right around the middle of the scale.

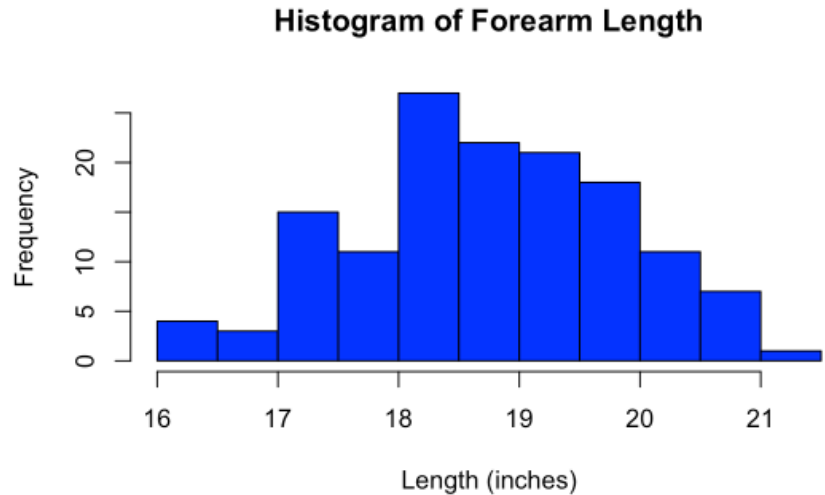


Figure 1: Histogram of the Forearm Length Data in Inches

In order to verify the normality of the data, we used the quantile-quantile plot. This test also reflected a normal distribution since the points are all very close together, following an approximately straight line. The central limit theorem also applies to this set of data, where the sample size is greater than 30. Now that

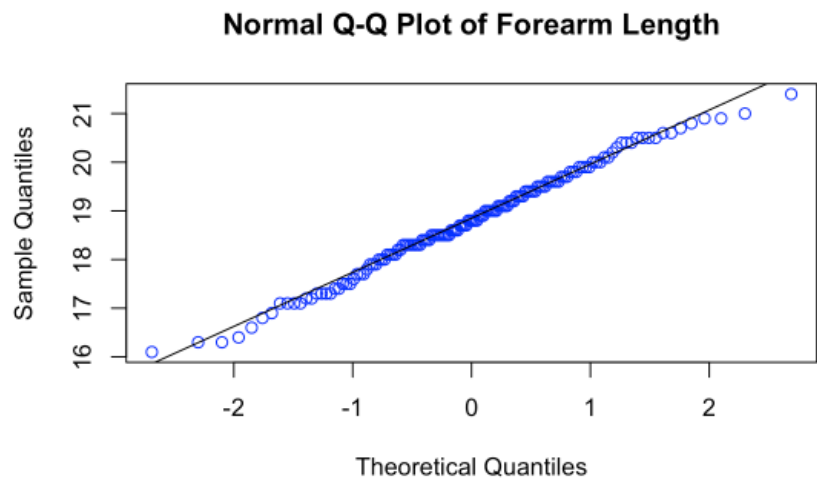


Figure 2: Normal Q-Q Plot of the Forearm Length Data

the assumptions of normality have been met, the statistical procedure to analyze the data can be the t-procedure.

Using RStudio, we were able to conduct a 90% confidence interval of (18.645, 18.959) with a mean of 18.802. With this information, we can assume that 90% of the time, the mean will fall in between (18.645, 18.959) and 10% of the time, it will not.

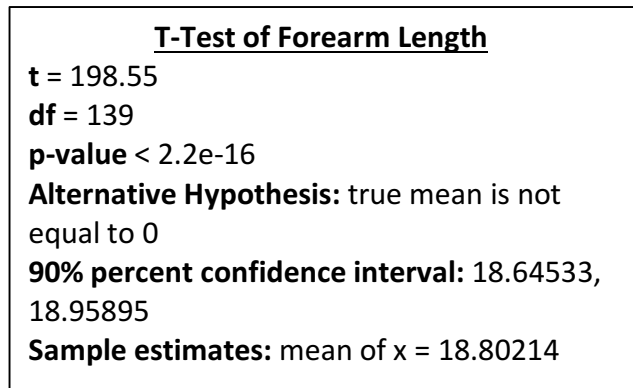


Figure 3: RStudio Output for the Forearm Length T-Test

After looking at several aspects of the Forearm Length Data, it is reasonable not to conduct a hypothesis test. Hypothesis tests must be determined before any statistical procedures are conducted, which means you must have enough information off the start to make this decision. Since the only information given is sample data and there is no other context, such as a research question, we are unable to state a null and alternative hypothesis. This data set also only contains one variable, meaning there is no relationship with other variables, which enables us to rule out a hypothesis test for proof. If this question had included a mean forearm length that they were testing the sample data against, it would have been more reasonable to follow through with a hypothesis test, making appropriate conclusions according to the original research question.