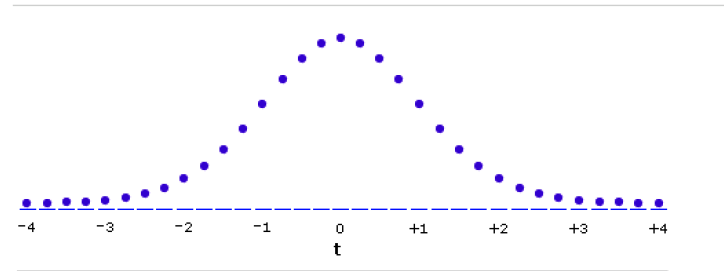
Minoo Ahmadi, Homework 1

**Part I**

1. A mean of 35.17 (SD = 29.32) was found for the population. A median of 27.5 indicates a right-skewness in the data, which is probably due to the maximum value of 150 for the subject with ID = 27. The variance is 860.15.
   1. H0: , H1:
   2. T-distribution: t(20)



* 1. Using an online t-table, the critical t-value for a two-sided test at alpha level of .05 is 2.086.
  2. t(20) = 1.28, which is smaller than (doesn’t exceed) the critical t-value.
  3. Using an online t-table: p>.05.
  4. . We can be 95% confident that the population mean commute time is between 24.41 and 53.68 minutes. Note that this interval includes the mean of 30 and that’s why we fail to reject the null.
  5. We failed to reject the null hypothesis.
  6. A two-sample t-test was performed to compare the sample mean commuting time in the sample to a hypothesized population mean of 30. Using an alpha level of 0.05, the sample mean of 39.04 (SD = 32.15) was found not to be statistically significantly different from this value (t(20) = 1.28, p > 0.05 (two-tailed)), suggesting that the mean commuting time in the sample is not significantly different from 30 minutes.

One Sample t-test

data: samp.data$commute

t = 1.2894, df = 20, p-value = 0.212

alternative hypothesis: true mean is not equal to 30

95 percent confidence interval:

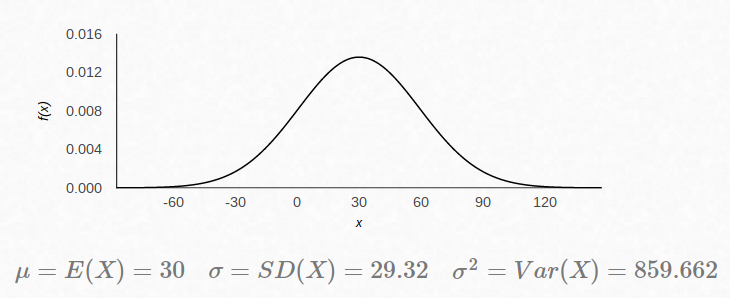
24.41011 53.68513

sample estimates:

mean of x

39.04762

1. Since we know the population variance, we’ll use a Z test. Here is the z distribution:



The z statistic:

It’s less than 1.96 (2SD from the mean), so we fail to reject the null. We get the same result by looking at a Z table. The value we get for a z-score of 1.41 is .9207 which falls within the 95% interval.

%95CI = [26.50 51.59]

One-sample z-Test

data: samp.data$commute

z = 1.4137, p-value = 0.1575

alternative hypothesis: true mean is not equal to 30

95 percent confidence interval:

26.50391 51.59133

sample estimates:

mean of x

39.04762

**Part II**

1. For diet 1:

median mean SE.mean CI.mean.0.95 var std.dev

194.00000000 193.00000000 2.90729788 5.90212847 304.28571429 17.44378727

coef.var

0.09038232

For diet 2:

median mean SE.mean CI.mean.0.95 var std.dev

174.50000000 176.00000000 2.31317826 4.69600152 192.62857143 13.87906954

coef.var

0.07885835

Mean is slightly larger than median for diet 1 which indicates a potential left skewness while its slightly less than the median for the diet 2 which indicates a potential right skewness. The histograms show such trends as well. But overall they look normally distributed. No outliers observed for either of the diets.





Boxplot for diet 1 (no outliers):



Boxplot for diet 2 (no outliers):



1. H0: , H1:

An independent groups t-test was performed comparing the mean blood pressure for the diet 1 (M = 193, SD = 17.44 ) with that for the diet 2 (M = 176, SD = 13.87 ). Using an alpha level of 0.05, this test was found to be statistically significant, t(70) = 4.57, p <0.01, indicating that diet 1 and diet 2 have different blood pressure outcomes and, to be more specific, diet 2 is associated with lower blood pressures.

Two Sample t-test

data: hyptension by diet

t = 4.5757, df = 70, p-value = 2e-05

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

9.590143 24.409857

sample estimates:

mean in group 1 mean in group 2

193 176

1. Levene’s test of equality of variances indicates the equality of variances can be assumed in our to groups:

modified robust Brown-Forsythe Levene-type test based on the absolute

deviations from the median

data: y

Test Statistic = 1.1056, p-value = 0.2966