UNPAIRED T-TEST:

This test is very similar to the paired t-test, but instead of comparing two measurements within our entire population, we use only one measurement but break our population into two natural subgroups, testing whether there is a statistically significant difference between the means of these two subgroups. As in the case of the paired t-test, our primary statistic of concern is the p-value, and again it has the same interpretation.

**Exercise 3**

Null hypothesis: There is no difference between the price of houses near to and far from the Charles River.

- Open the **Boston Housing Data** file from the CS130 Public folder..
- From the **Analyze** menu, select **Compare Means** then **Independent Samples T-Test**
- Transfer the variable **median** to the **Test Variable(s)** box
- Transfer the variable **Charles** to the **Grouping Variable** box
- Click on **Define Groups** and then enter Nea (short for Near) and Far (see picture below)
- Click Continue and then OK.

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>df</td>
</tr>
<tr>
<td><strong>MEDIAN</strong></td>
<td>8.752</td>
<td>.003</td>
<td>504</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>3.113</td>
<td>36.876</td>
<td>.004</td>
</tr>
<tr>
<td><strong>ME</strong></td>
<td>9.317</td>
<td>.0001</td>
<td>500</td>
</tr>
</tbody>
</table>

Question: Should we accept the null hypothesis?
Correlation Analysis:

Correlation Analysis addresses the following: Is there a statistically significant association between variable X and variable Y?

Null hypothesis tested: There is no statistically significant association between variable X and variable Y.

Level of statistical significance: Set \( p = 0.05 \) so that the probability of rejecting the null hypothesis when it is in fact true is less than 1 in 20.

Remember,

if \( p < 0.05 \), reject the null hypothesis
if \( p \geq 0.05 \), accept the null hypothesis

Use scattergrams (scatterplots) to visually display data analyzed with this test.

Question: Is there a statistically significant association between age and cholesterol in the subjects of the Lipid Data study?

Q1: What is the Null Hypothesis?

_______________________________________________________

_______________________________________________________

Q2: Should we accept or reject the Null Hypothesis? Why?

_______________________________________________________

_______________________________________________________

Q3: State your conclusion:

_______________________________________________________

_______________________________________________________

Q4: Question: What is your expected Cholesterol level at age: (a) 25 (b) 50 based on this information?