Capstone Project 1 Update

21st April 2018

Inferential Statistics

Using the information learned from the visualizations created and Market Basket Analysis, we created hypotheses to test on the population data. The data set is comprised of categorical variables therefore the Chi-Square test statistic was used. The Chi-Square test tests the strength of association between variables. 5 different hypotheses were tested and the results are listed below.

1. Compare Crime Category with Zip Code

- **Null Hypothesis:** There is no association between the crime type and zip code.
- **Alternate Hypothesis:** There is an association between the crime type and zip code.
- **Answer:** P-value = 0.0, null hypothesis is rejected

2. Compare Crime Category with Time Crime Occurred

- **Null Hypothesis:** There is no association between the crime type and time of day crime occurred.
- **Alternate Hypothesis:** There is an association between crime type and time of day crime occurred.
- **Answer:** P-value = 0.0, null hypothesis is rejected

3. Compare Crime Category with Season of the year

- **Null Hypothesis:** There is no association between crime type and season of the year.
- **Alternate Hypothesis** There is an association between crime type and season of the year.
- **Answer:** P-value = 3.4184825183899065e-07, null hypothesis is rejected

4. Compare Crime Category with Month

- **Null Hypothesis:** There is no association between crime type and premise type.
- **Alternate Hypothesis** There is an association between crime type and premise type.
- **Answer:** P-value = 1.6102836646351823e-18, null hypothesis is rejected

5. Compare Crime Category with Premise Type

- **Null Hypothesis:** There is no association between crime type and premise type.
- **Alternate Hypothesis** There is an association between crime type and premise type.
- **Answer:** P-value = 0.0, null hypothesis is rejected

From the hypothesis testing we see that Crime Type has significant associations with Zip Code, Time Crime Occurred, Premise Type, Season of the year or Months.