

MTH 1210

Lab 1 Graphs of Data, Summary Statistics

Part A: Qualitative Data and Bar Plots

In a study to investigate the hypothesis that victims of violence exhibit more violent behavior toward others, a researcher searched court records to find 908 individuals who had been victims of abuse as children. She then found 667 individuals, with similar demographic characteristics, who had not been abused as children. She then searched through subsequent years of court records to determine how many of the people in each of these groups committed violent crimes later in life. The file **violence.mpx** contains the data.

1. Open the data in the MINITAB *project violence.mpx*. (Either open it directly from the course website or save it to your computer and then open it. If you saved it to your computer, either double click its icon or start MINITAB and use FILE > OPEN).
2. Make a bar plot of the **Abuse Victim** (Yes/No) variable:

GRAPH > BAR CHART

This will take you to a dialog box and selection of types of bar plots.

BARS REPRESENT: Select 'Counts of unique values'

Choose: SIMPLE

< OK >

In the dialog box: Select the categorical variable (double click)

< OK >

This will produce the desired bar plot.

3. Now make a bar plot of the **Committed Violent Crime** (Yes/No) variable (GRAPH > BAR CHART again).
4. **Copy and paste the two bar plots into the Answer Sheet.**
5. Now make a bar plot showing *both* qualitative (categorical) variables in the *same* graph:

GRAPH > BAR CHART

This will take you to a dialog box and selection of types of bar plots.

BARS REPRESENT: Select 'Counts of unique values'

Choose: CLUSTER

< OK >

In the dialog box: Select both categorical variables (double click)

< OK >

This will produce the desired bar plot.

6. **Copy and paste the bar plot into the Answer Sheet**

Part B: Graphing and Summarizing Quantitative Data

The file **planes.mtw** contains data on the number of airplane departures per day for various airports.

7. Open the *MINITAB project planes.mpx*.
8. Construct a histogram of the data:

GRAPH > HISTOGRAM

In the first box: Select "Simple"

In the second box: Select the variable (double click).

< OK >

You can interactively reset the title and axis labels in the graphics window (double click on them).

9. **Copy and paste the histogram into the Answer Sheet.**
10. **Please answer Question 1 on the Answer Sheet.**
11. Now compute the sample mean, median, and standard deviation of the numbers of departures:

STAT > BASIC STATISTICS > DISPLAY DESCRIPTIVE STATISTICS

In the dialog box: VARIABLES: Select the variable (double click).

< STATISTICS >

Check the boxes for the statistics that you want and uncheck the ones you don't want.

< OK >

< OK >

This will produce the set of statistics in the output window.

12. **Please answer Questions 2, 3 and 4 on the Answer Sheet.**

Part C: Outliers

The table below shows (part of) a data set on the numbers deaths by lightning strikes in the U.S. for each of the years 1959 - 2005, as compiled by the National Climatic Data Center from reports by the National Weather Service.

Year	Number of Lightning Deaths
1959	75
1960	48
1961	61
1962	48
1963	150
...	...
2005	38

The full data set is in the file **lightning.mpx**.

1. Open the *MINITAB project lightning.mpx*.

2. Now compute the sample mean, median, standard deviation, and interquartile range for the numbers of deaths using the instructions in **Step 5** of **Part B**.
3. **Please answer Question 1 on the Answer Sheet.**
4. Make a histogram of the data using the instructions in **Step 2** of **Part B**.
5. Regarding the outlier (150 deaths in 1963), a National Weather Service report states:

"On December 8, 1963 the crash of a jetliner killing 81 people near Elkin, Maryland, was attributed to lightning by the Civil Aeronautics Board investigators."

Subtract the 81 airliner crash deaths from the 1963 death count by replacing the value 150 in the lightning deaths data set by 69 (= 150 - 81).

6. Now recreate the histogram of the data (after correcting the outlier).
7. **Copy and paste the (most recent) histogram into the Answer Sheet.**
8. Recompute the mean, median, standard deviation, and interquartile range (after correcting the outlier).
9. **Please answer Question 2 on the Answer Sheet.**
10. **Print your Answer Sheet and hand it in.**