Descriptives

```
> ### Frequency Distribution

> FrequencyTable <- table(Outcome)
> FrequencyTable

Outcome
0 3 4 5 7 9
2 1 2 1 1 1

> prop.table(FrequencyTable)

Outcome
    0     3     4     5     7     9
0.250 0.125 0.250 0.125 0.125 0.125

> ### Descriptive Statistics

> length(Outcome)

[1] 8

> mean(Outcome)

[1] 4

> var(Outcome)

[1] 9.714286

> sd(Outcome)

[1] 3.116775
```

These statistics were obtained using the command described on the previous page of this guide. Note that they are calculated separately for each variable.

The Mean and Standard Deviation are calculated as unbiased estimates of the respective population parameter. Here, the mean ("M") is determined as the average of the scores weighted by their frequencies:

$$M = \frac{\sum(fY)}{N} = \frac{(2 \times 0) + (1 \times 3) + (2 \times 4) + (1 \times 5) + (1 \times 7) + (1 \times 8)}{8} = 4$$

The Variance and Standard Deviation are both functions of the Sum of Squares (not shown in the output) of the scores in the frequency distribution:

$$SS = \sum f(Y - M)$$

$$SS = 2(0-4)^2 + 1(3-4)^2 + 2(4-4)^2 + 1(5-4)^2 + 1(7-4)^2 + 1(8-4)^2 = 68$$

Then, the Variance (also known as Mean Squares) is calculated as:

$$MS = \frac{SS}{(N-1)} = \frac{68}{7} = 9.714$$

Finally, the Standard Deviation ("SD") is determined by:

$$SD = \sqrt{MS} = \sqrt{9.71} = 3.117$$