

Descriptives

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> ### Frequency Distribution
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```
> (Outcome) |> describeFrequencies()
```

Frequencies for the Data

	Freq	Perc	CumFreq	CumPerc
0	2.000	0.250	2.000	0.250
3	1.000	0.125	3.000	0.375
4	2.000	0.250	5.000	0.625
5	1.000	0.125	6.000	0.750
7	1.000	0.125	7.000	0.875
9	1.000	0.125	8.000	1.000

```
> ### Descriptive Statistics
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```
> (Outcome) |> describeMoments()
```

Summary Statistics for the Data

	N	M	SD	Skew	Kurt
Outcome	8.000	4.000	3.117	0.151	-0.467

These statistics were obtained using the command described on the previous page of this guide.

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:

$$\begin{aligned} SS &= \sum f(Y - M)^2 \\ SS &= 2(0 - 4)^2 + 1(3 - 4)^2 + 2(4 - 4)^2 + 1(5 - 4)^2 + 1(7 - 4)^2 \\ &\quad + 1(8 - 4)^2 = 68 \end{aligned}$$

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:

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