Frequencies and Descriptives

"N" provides the sample size for the entire data set. "Missing" refers to the number of entries that are blank, whereas "Valid" is the number of entries that are not blank.

Statistics

Outcome

N	Valid	8
	Missing	0
Mean		4.0000
Std. Deviation		3.11677
Variance		9.714
Percentiles	25	2.2500
	50	4.0000
	75	5.5000

The "Mean", "Standard Deviation", and "Variance" are all calculated as unbiased estimates of the respective population parameter. Here, the mean 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 "Std. Deviation" are both functions of the Sum of Squares (not shown in the output) of the scores in the frequency distribution:

$$SS = \sum f(Y - M)$$
$$SS = 2(0 - 4)^2 + 1(3 - 4)^2 + 2(4 - 4)^2 + 1(5 - 4)^2 + 1(7 - 4)^2 + 1(8 - 4)^2 = 68.000$$

The "Variance" (i.e., Mean Squares) and "Std. Deviation" are calculated as:

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

$$SD = \sqrt{MS} = \sqrt{9.714} = 3.117$$

Outcome

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0.00	2	25.0	25.0	25.0
	3.00	1	12.5	12.5	37.5
	4.00	2	25.0	25.0	62.5
	5.00	1	12.5	12.5	75.0
	7.00	1	12.5	12.5	87.5
	9.00	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

"Percentiles" provide the scores associated with particular percentile ranks. For example, the 50th percentile is the score in the following position:

$$Position = PR(N + 1) = .50(8 + 1) = 4.5$$

Thus, the score at the 50th percentile is the 4.5th score in the frequency distribution – a score of 4. Similarly, a score of .75 is at the 25th percentile and a score of 6.5 is at the 75th percentile. Importantly, in some cases, the score values are non-integer interpolated values.

The "Valid" column lists all of the actual scores in the entire data set. "Frequency" indicates the number of times that score exists. For example, the score 4 was listed 2 times.

The "Percent" column provides the percentage of cases for each possible score. For example, of the 8 scores in the entire data set, the score of 4 was listed 2 times and 2/8 is 25.0%.

The "Valid Percent" column provides the percentage of cases for each possible score divided by the total number of cases. Here, there were no missing scores, so the percent columns are equal.

"Cumulative Percent" is the sum of all percentages up to and including the row in question. For example, 62.5% of scores were a 4 or smaller. Similarly, 37.5% were a 3 or smaller.