Homework 2: Descriptive Statistics and Variability

1. Make a frequency distribution table for the following data that includes the frequency and the relative frequency for scores:

74 103 95 98 81 117 105 99 63 86 94 107 96 100 98 118 107 82 84 71 91 107 84 77

|  |  |  |
| --- | --- | --- |
| Class | Frequency | Relative Frequency |
| 60-69 | 1 | .04 |
| 70-79 | 3 | .13 |
| 80-89 | 5 | .21 |
| 90-99 | 7 | .29 |
| 100-109 | 6 | .25 |
| 110-119 | 2 | .08 |

1. Answer the questions below on the basis of this figure:
	1. Is this figure a bar graph or a histogram? Explain your answer.

Given that the bars are touching and that the variable on the x-axis appears to be continuous, this must be a histogram.

* 1. How many modes does the figure include?

There is a single mode at 88.

* 1. Is the figure positively-skewed, negatively-skewed or symmetrical?

The data appear to be negatively skewed as the tail appears in the lower end of the distribution.

1. Calculate the sums of squares for the following set of data: 4, 6, 7, 8, 10.

|  |  |  |
| --- | --- | --- |
|  | X | X^2 |
|  | 4 | 16 |
|  | 6 | 36 |
|  | 7 | 49 |
|  | 8 | 64 |
|  | 10 | 100 |
|  |  |  |
| Sum | 35 | 265 |

$$SS= \sum\_{}^{}\left(x^{2}\right)-\frac{\left(\sum\_{}^{}x\right)^{2}}{n}$$

$$SS= 265-\frac{\left(35\right)^{2}}{5}= 265-245=20$$

1. The numbers that follow represent the total number of hours of sleep that I received each night for the first week of the semester: 6, 7, 7, 6, 7, 4.5, 8.  Find, the mean, median, mode, variance and standard deviation for these data.  Show your work.

|  |  |
| --- | --- |
| Day | Hrs. Sleep |
| Sunday | 6 |
| Monday | 7 |
| Tuesday | 7 |
| Wednesday | 6 |
| Thursday | 7 |
| Friday | 4.5 |
| Saturday | 8 |
|  |  |
| Sum | **45.5** |

Mean = Σ(x) / 7

 = 45.5 / 7

 = **6.5**

Median = 4.5 6 6 **7** 7 7 8

 There are seven observations, so we select the [(7/2) + ½]= 4th observation.

 The 4th observation is 7(highlighted in red).

Mode = Also equals **7**; it occurs three times.

1. Oddly, I wound up getting 12 hours of sleep one night during the third week of the semester. Which MCT would likely be most affected by that single anomalous score?

A value of 12 would represent an outlier in the distribution and the mean is the MCT that is most affected by outliers.