

Assignment 1: Basic Concepts

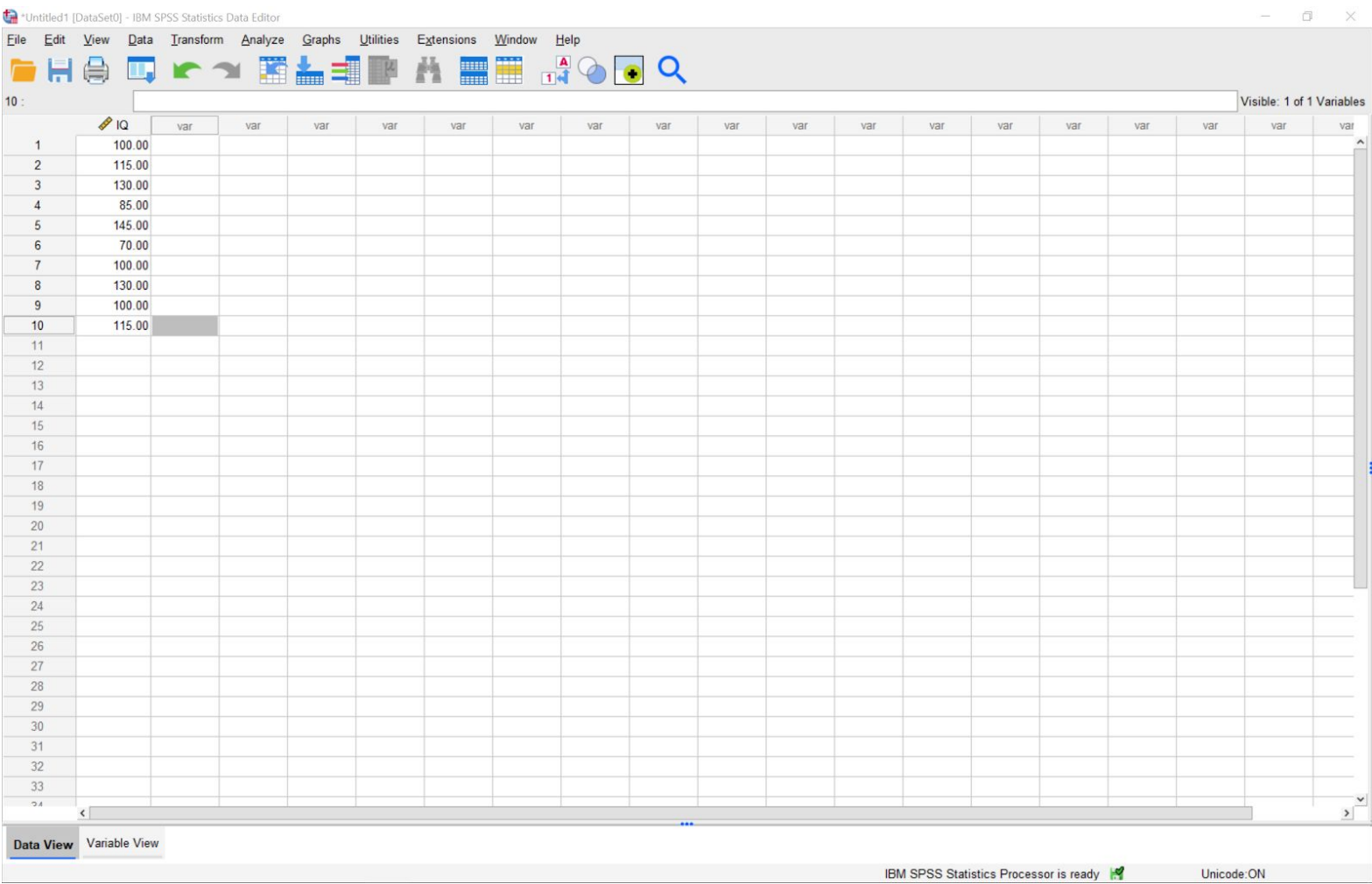
Use the following IQ scores for your SPSS calculations and written answers.

| | | | | | | | | | |
|-----|-----|-----|----|-----|----|-----|-----|-----|-----|
| 100 | 115 | 130 | 85 | 145 | 70 | 100 | 130 | 100 | 115 |
|-----|-----|-----|----|-----|----|-----|-----|-----|-----|

SPSS Instructions

- On the bottom left, click Variable View.
- Enter 'IQ' in the first cell.
- On the bottom left, click Data View.
- Enter the IQ scores in the first column.
- Click Analyze, Descriptive Statistics, Frequencies.
- Move the IQ icon over to the Variable(s) box. Click Statistics on the right.
- Select Mean, Median, Mode, Std. deviation.
- Click Continue and OK. A new window will open. This is your Output file.
- Click Graphs, Chart Builder. (If a window other than the Chart Builder appears, check 'Do not show this dialog again' and then exit it by clicking on the x on the top right. Click Graphs and Chart Builder again.)
- Near the bottom left, select boxplot. Drag the 3rd boxplot icon to the box above.
- Near the top left, drag the IQ icon to the x axis of the boxplot.
- Click OK.
- Save the Data file and Output file separately. Use informative file names.

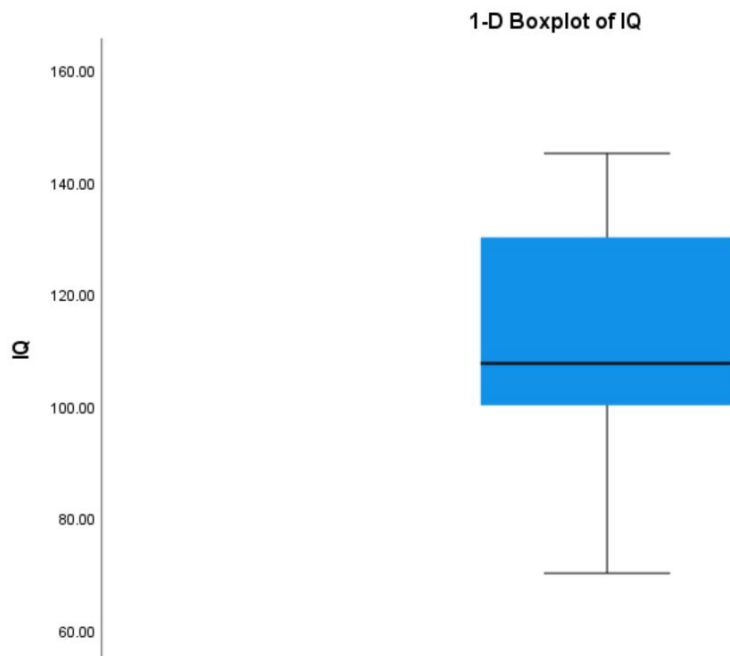
SPSS Data



SPSS Output

| Statistics | | |
|----------------|---------|----------|
| IQ | Valid | 10 |
| | Missing | 0 |
| Mean | | 109.0000 |
| Median | | 107.5000 |
| Mode | | 100.00 |
| Std. Deviation | | 22.58318 |

GGraph



IBM SPSS Statistics Processor

Written Answers

Show all work.

- (1) Calculate the mean.
- (2) Calculate the median.
- (3) Find the mode.
- (4) Use the computational formula to calculate the standard deviation.
- (5) Create a boxplot.

1.) mean

$$(100 + 115 + 130 + 85 + 145 + 70 + 100 + 130 + 100 + 115) / 10 = \boxed{109}$$

2.) median

Scores in order: 70, 85, 100, 100, 100, 115, 115, 130, 130, 145

$$\text{median location} = (N+1)/2 = 11/2 = 5.5$$

$$\text{Average of 5th and 6th number} = \frac{100 + 115}{2} = \boxed{107.5}$$

3.) Mode

100

4 Standard deviation

$$s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{N}}{N-1}}$$

$$\sum x^2 =$$

$$(\sum x)^2$$

$$70^2 = 4900$$

$$70$$

$$85^2 = 7225$$

$$85$$

$$100^2 = 10,000$$

$$100$$

$$100^2 = 10,000$$

$$100$$

$$100^2 = 10,000$$

$$100$$

$$115^2 = 13,225$$

$$115$$

$$115^2 = 13,225$$

$$115$$

$$130^2 = 16,900$$

$$130$$

$$130^2 = 16,900$$

$$130$$

$$145^2 = 21,025$$

$$145$$

$$= 123,400$$

$$= 1090 \rightarrow 1090^2 = 1,188,100$$

$$s = \sqrt{\frac{123,400 - \frac{1,188,100}{10}}{9}}$$

$$\boxed{s = 22.58}$$

5.) Boxplot

Median location = 5.5

Median = 107.5

Interquartile location

- $(\text{Median location} + 1) / 2 = (5 + 1) / 2 = 3$

- The third lowest and highest ^{↑ dropped decimal} numbers are 100 and 130

Interquartile range (IR)

$$130 - 100 = 30$$

Whiskers

- extend no more than $1.5 \times \text{IR}$ past the interquartile location points. $1.5 \times \text{IR} = 1.5 \times 30 = 45$

- Lower whisker bound = $100 - 45 = 55$. Lowest above 55 is 70

- Upper whisker bound = $130 + 45 = 175$. Highest below 175 is 145

Outliers

- none

150
145
140
130
120
110
107.5
100
90
80
70
60
50
Σ
○

