Topics: Descriptive Statistics and Probability

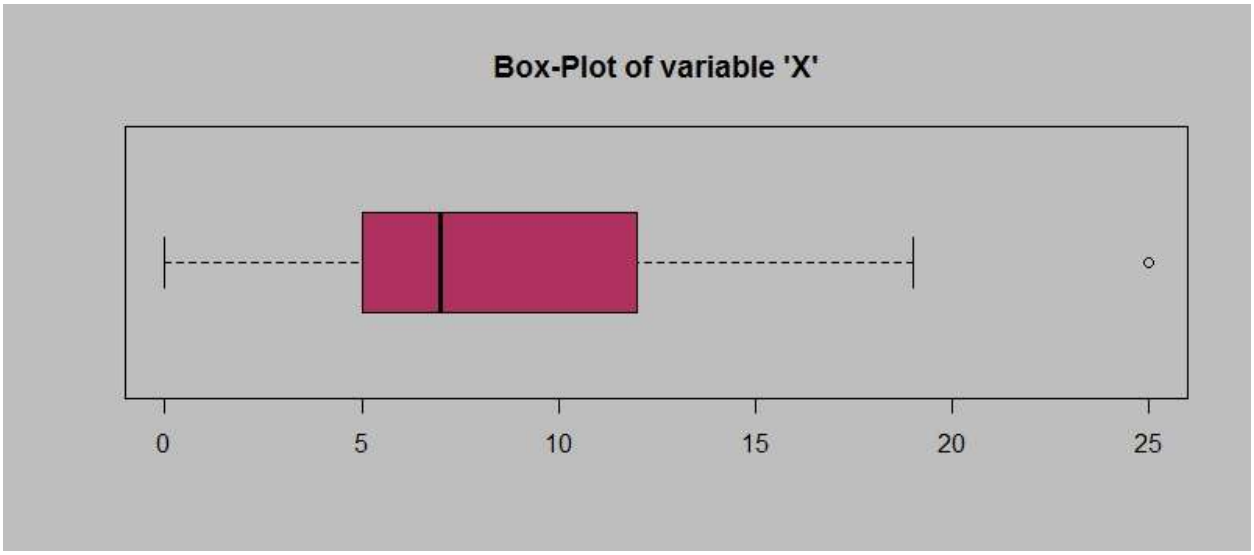
1. Look at the data given below. Plot the data, find the outliers and find out μ, σ, σ^2

Name of company	Measure X
Allied Signal	24.23%
Bankers Trust	25.53%
General Mills	25.41%
ITT Industries	24.14%
J.P.Morgan& Co.	29.62%
Lehman Brothers	28.25%
Marriott	25.81%
MCI	24.39%
Merrill Lynch	40.26%
Microsoft	32.95%
Morgan Stanley	91.36%
Sun Microsystems	25.99%
Travelers	39.42%
US Airways	26.71%
Warner-Lambert	35.00%

Ans : From the box plot it is clear that there is one outlier lies beyond 90% and from the given data it is 91.36%.

Questions referred to from *Aczel A., Sounderpandian J., Complete Business Statistics (7ed.)*

2.



Answer the following three questions based on the box-plot above.

(i) What is inter-quartile range of this dataset? (please approximate the numbers) In one line, explain what this value implies.

Ans : The inter-quartile range of this dataset lies between 5 to 12 and the outliers lies outside this range. There is one outlier according to this plot.

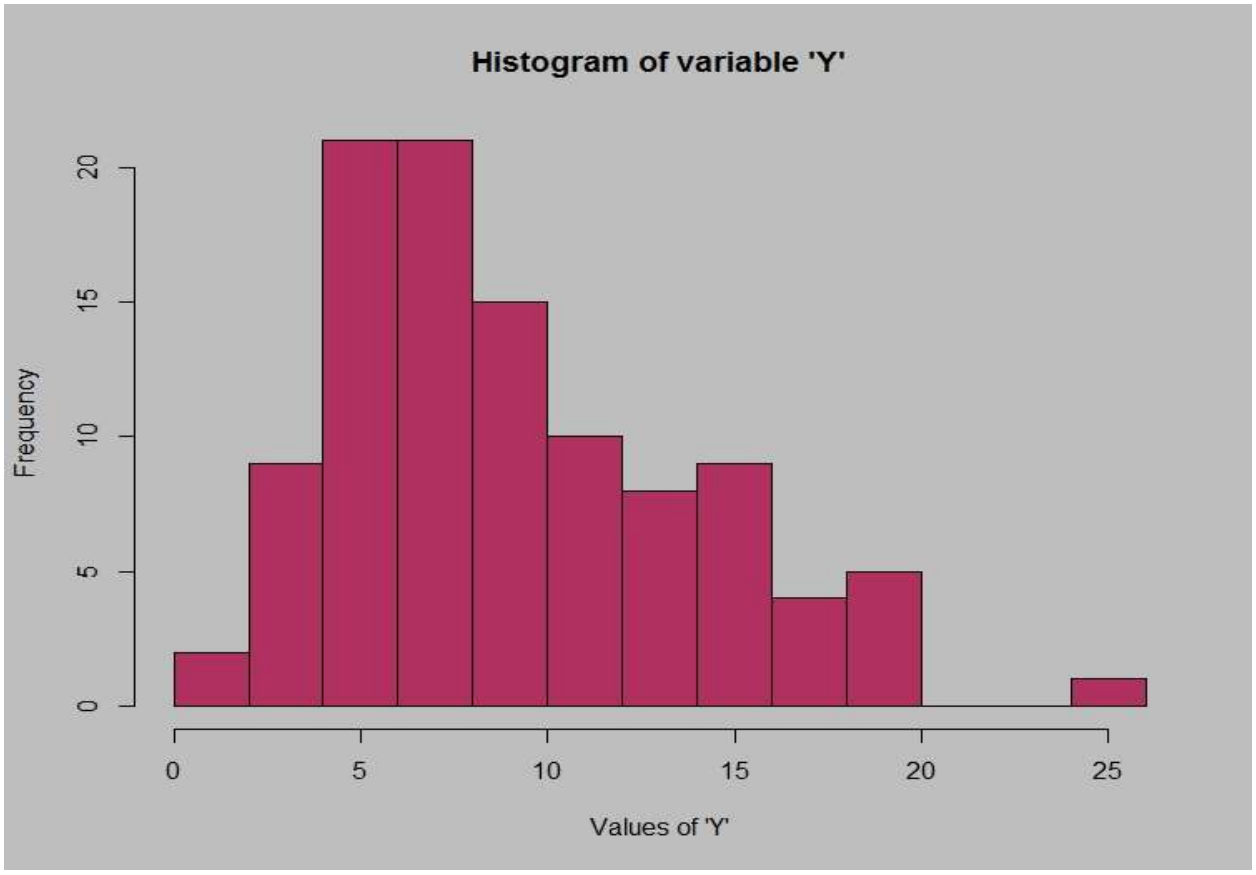
(ii) What can we say about the skewness of this dataset?

Ans : Positive Skewness

(iii) If it was found that the data point with the value 25 is actually 2.5, how would the new box-plot be affected?

Ans : The inter quartile range will change.

3.



Answer the following three questions based on the histogram above.

(i) Where would the mode of this dataset lie?

Ans : Mode of this dataset lie between 4 to 8.

(ii) Comment on the skewness of the dataset.

Ans : Right skewed

(iii) Suppose that the above histogram and the box-plot in question 2 are plotted for the same dataset. Explain how these graphs complement each other in providing information about any dataset.

Ans : Both of them are right skewed and have outliers. Median is easy to find in boxplot whereas mode is easy to find in histogram.

4. AT&T was running commercials in 1990 aimed at luring back customers who had switched to one of the other long-distance phone service providers. One such commercial shows a businessman trying to reach Phoenix and mistakenly getting Fiji, where a half-naked native on a beach responds incomprehensibly in Polynesian. When asked about this advertisement, AT&T admitted that the portrayed incident did not actually take place but added that this was an enactment of something that "could happen." Suppose that one in 200 long-distance telephone calls is misdirected. What is the probability that at least one in five attempted telephone calls reaches the wrong number? (Assume independence of attempts.)

5. Returns on a certain business venture, to the nearest $1,000, are known to follow the following probability distribution

x	P(x)
-2,000	0.1
-1,000	0.1
0	0.2
1000	0.2
2000	0.3
3000	0.1

(i) What is the most likely monetary outcome of the business venture?
Ans : Highest probability is for 2000.

(ii) Is the venture likely to be successful? Explain
Ans : Yes, because the total earnings of the venture is 800.

(iii) What is the long-term average earning of business ventures of this kind? Explain
Ans : Income = x * p(x) = 800

(iv) What is the good measure of the risk involved in a venture of this kind? Compute this measure
Ans : Variance = 86666.666667
More variance means more risk.