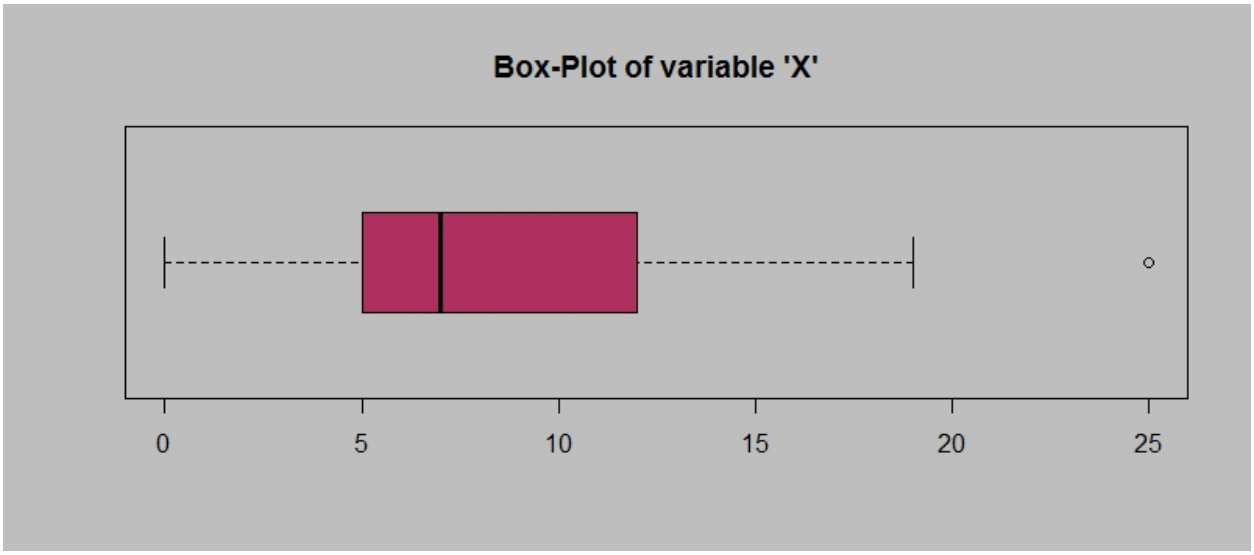
Topics: Descriptive Statistics and Probability

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%

Mean=0.3327133,
sd=0.169454,
var=0.02871466,
Outlier=Morgan Stanley=91.36%

2.



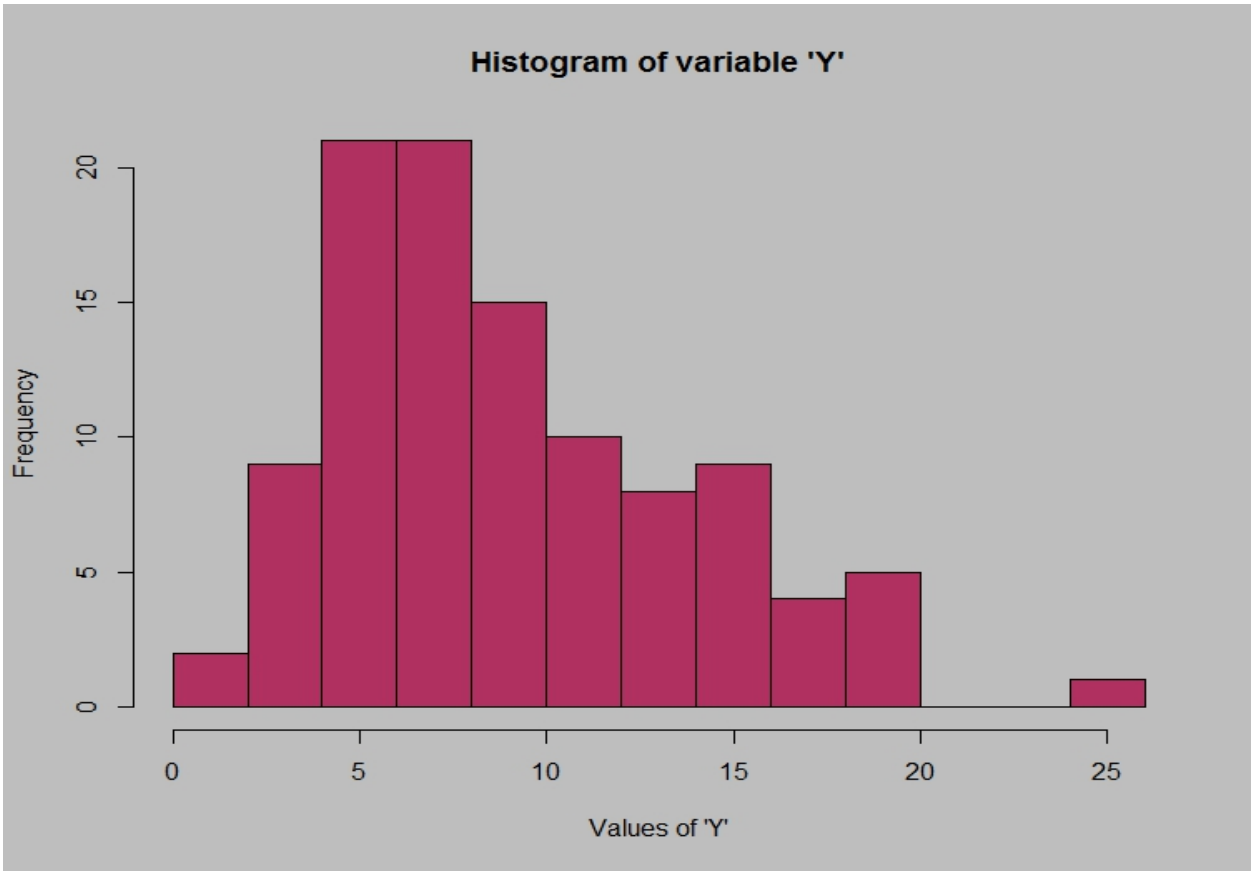
Answer the following three questions based on the box-plot above.

(i) What is inter-quartile range of this dataset? (please approximate the numbers) In one line, explain what this value implies.
Answer- IQR =12-5= 7, IQR represents 50% of data.

(ii) What can we say about the skewness of this dataset?
Answer- Dataset is right skewed since mean is less than median.

(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?
Answer- Then Boxplot won't have any outlier.

3.



Answer the following three questions based on the histogram above.

(i) Where would the mode of this dataset lie?
Answer- between 4-6 & 6-8.

(ii) Comment on the skewness of the dataset. Answer - 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.
Answer:

1. Box plot provides outlier values, which fails to provide by histogram.
2. Similarly histogram provides the frequency of datapoints, which fails to provide by box plot.

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.)

   E: The call is misdirected.

Then probability of the event E is
P(E)= 1/200
Therefore,
Probability that at least one in 5 attempted call reaches the wrong number
= 1 - Probability that no attempted call reaches the wrong number
= 1 – P(E bar)
= 1 – (199/200)* (199/200)* (199/200)* (199/200)* (199/200)
= 1 - (199/200)^5
= 0.025

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?
Answer - 2000

(ii) Is the venture likely to be successful? Explain
Answer: Yes. The venture is likely to be successful 60% with positive return and 20% chances of negative returns

(iii) What is the long-term average earning of business ventures of this kind? Explain
Answer: ((-2000*1)+ (-1000*1)+ (1000*2)+ (2000*3)+ (3000*1) / 6) = 8000/6 = 1333

(iv) What is the good measure of the risk involved in a venture of this kind? Compute this measure.
Answer: good measure is positive returns in this data which is 60%