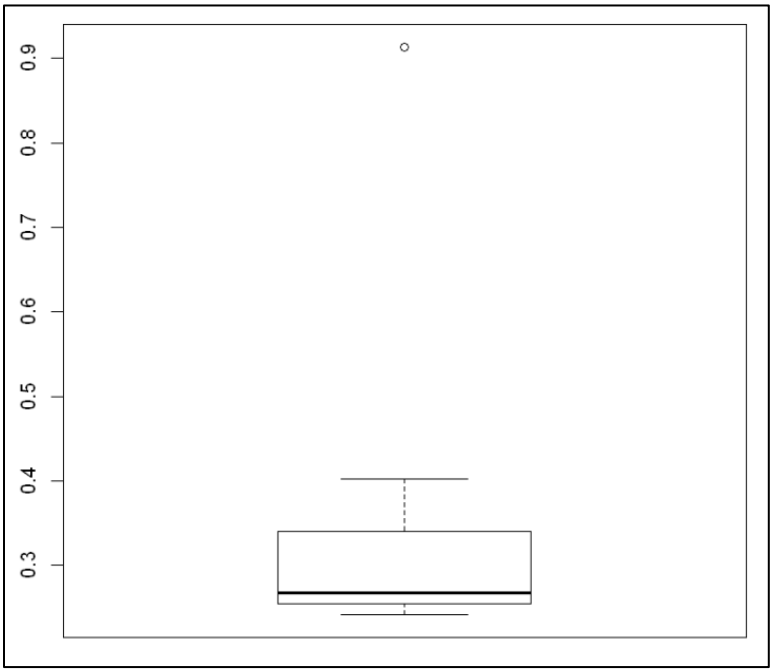
Topics: Descriptive Statistics and Probability

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%

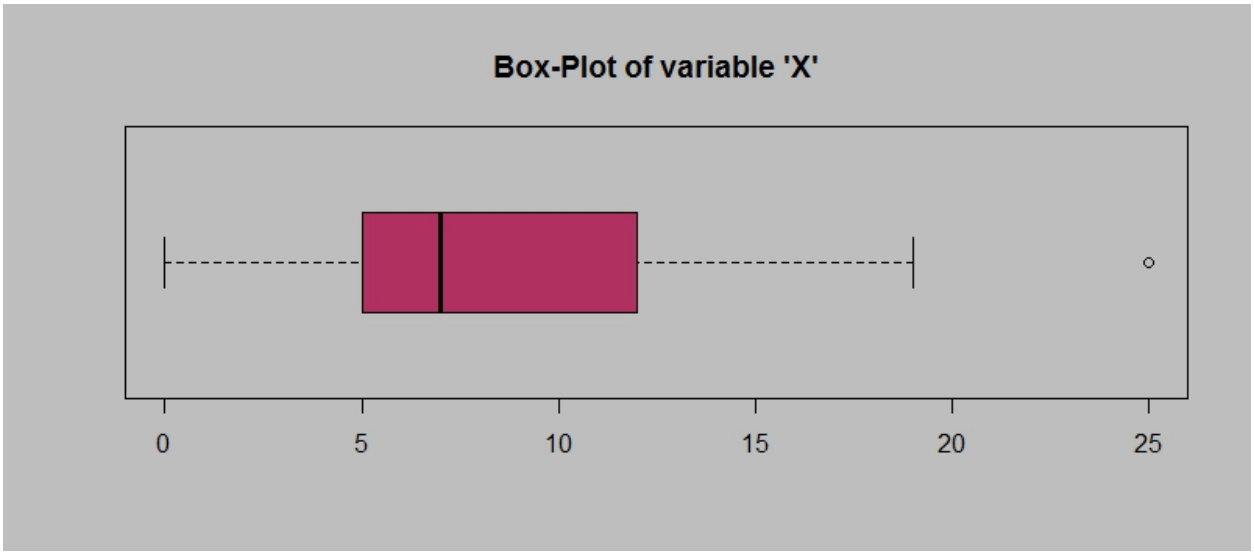
ANS :



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

Mean: 0.332
Std: 0.169
Variance: 0.028

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.

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

(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?

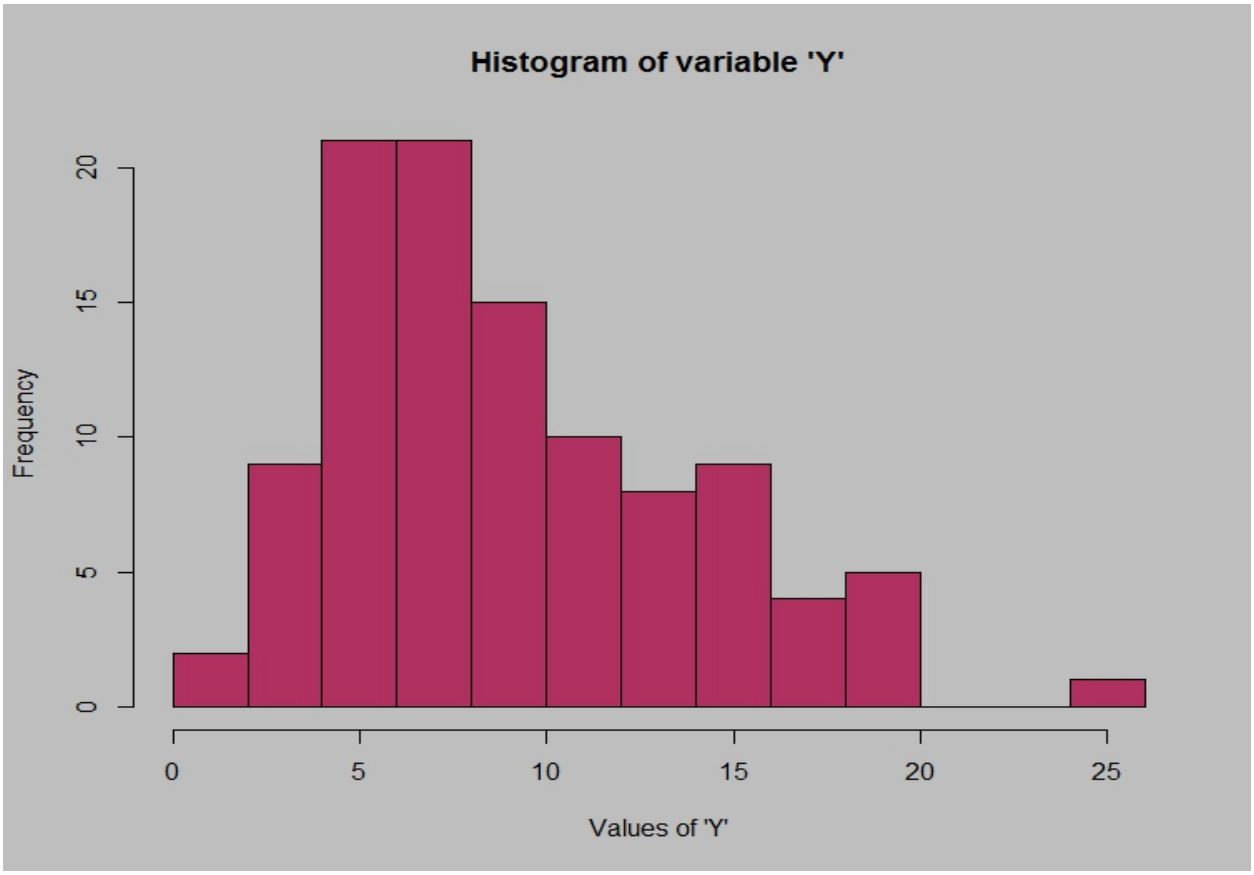
ANS :

(i) The IQR range is 12 - 5 =7 approximately. This value implies most of the data values lies in this range. 50% of data lies in this range.

(ii) The data set is right skewed

(iii) The boxplot won't have any outliers and it won't affect the data much.

3.



Answer the following three questions based on the histogram above.

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

(ii) Comment on the skewness of the dataset.

(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:

(i) The mode lies between 3 and 9 since the majority of the values lies in this range.

(ii) Positively skewed

(iii) Both the graphs represent 25 as an outlier and both are positively skewed.

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.)

   ANS : 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?
(ii) Is the venture likely to be successful? Explain
(iii) What is the long-term average earning of business ventures of this kind? Explain
(iv) What is the good measure of the risk involved in a venture of this kind? Compute this measure

ANS :

(i) 2000$ as it has the highest probability.
(ii) If we consider the positive values there would be a chance of 60% successful
(iii) (-2000*0.1) + (-1000 * 0.1) + (0 * 0.2) + (1000 * 0.2) + (2000 * 0.3) + (3000 * 0.1) = 800$ average
(iv) To calculate the standard deviation and compare it with the mean. Here the standard deviation is 1707 . It is large when compared to the mean. So it is highly risky.