

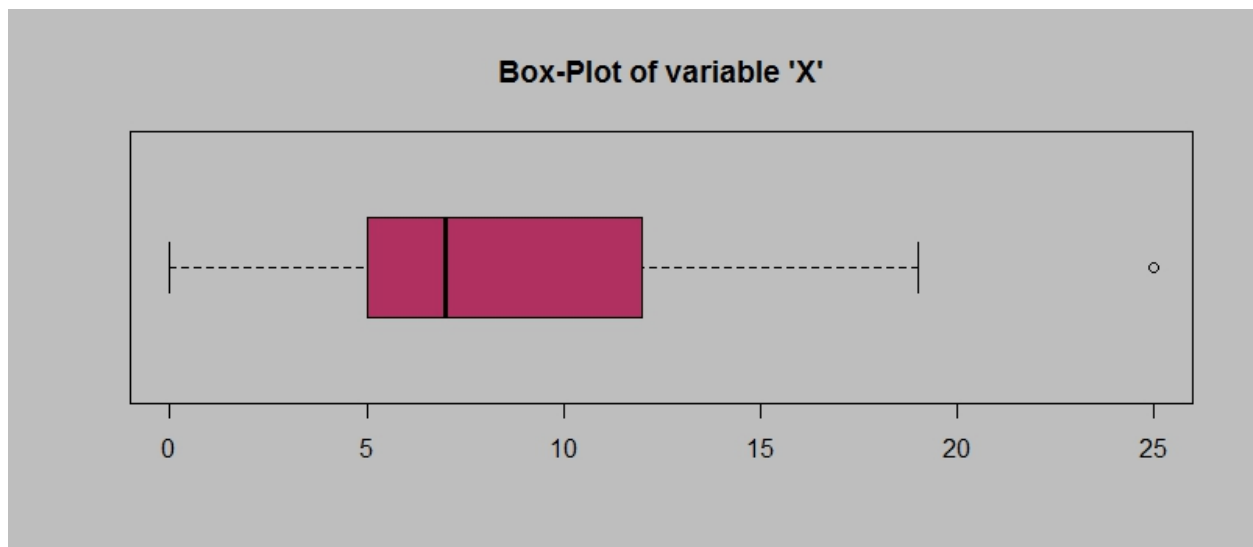
Topics: Descriptive Statistics and Probability

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: $\mu = 0.3327$, $\sigma = 0.1694$, $\sigma^2 = 0.028$

- 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.

Ans: Range from 5 to 12. Sticky 0 to 9 and 1 outlier.

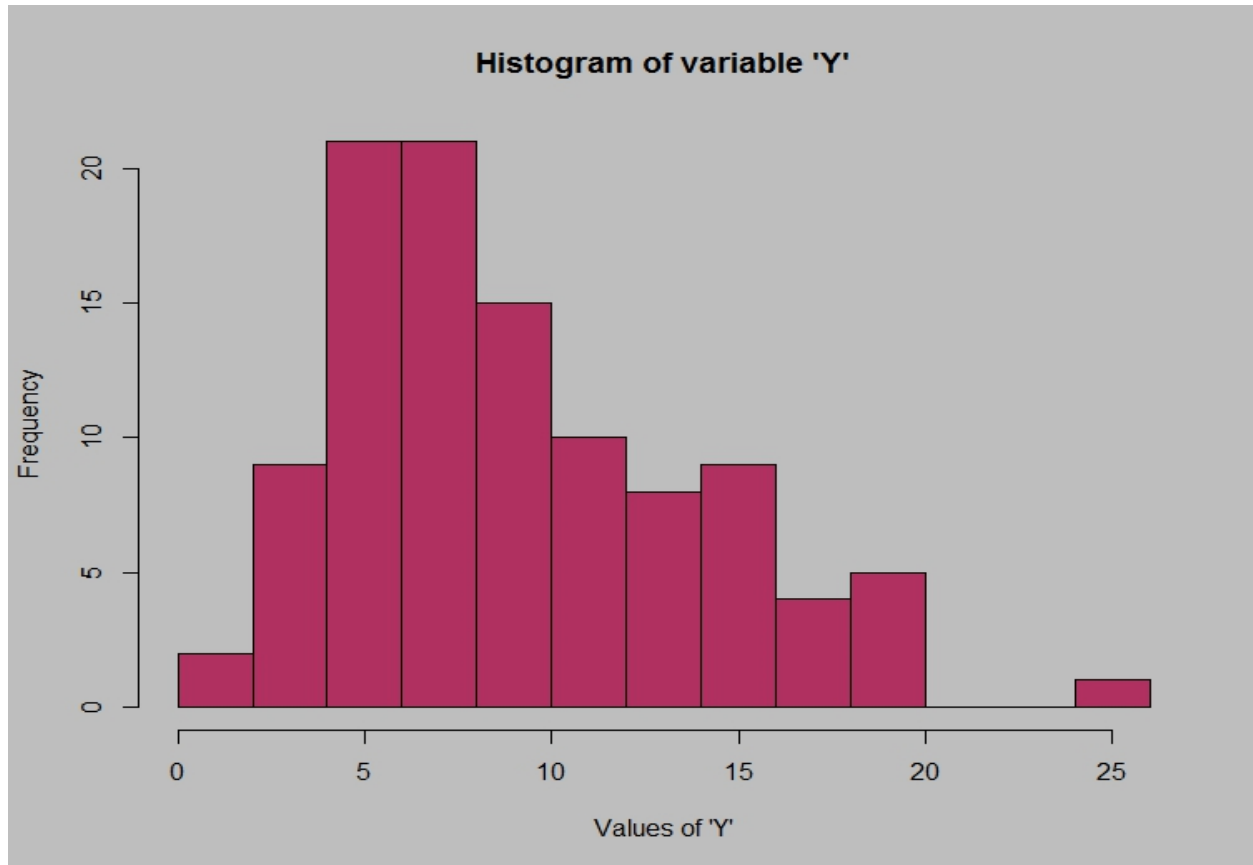
(ii) What can we say about the skewness of this dataset?

Ans: Left Skewed.

(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: Scale the Charts.

3.



Answer the following three questions based on the histogram above.

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

Ans: 4 to 8.

(ii) Comment on the skewness of the dataset.

Ans: Left 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: We can't compare both mode in Box plot, But we can do that using 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.)

Ans: Let E : Call is misdirected then probability of event E is $P(E) = 1/200$.
 Therefore, $P(E^c) = 1 - P(E) = 1 - 1/200 = 199/200$
 Probability that at least one in 5 attempted call reaches the wrong number =
 $1 - \text{probability that no attempted call reaches the wrong number}$
 $= 1 - (199/200 \times 199/200 \times 199/200 \times 199/200 \times 199/200)$
 $= 1 - (199/200)^5$
 $= 7920399001 / 200^5$
 $P = 0.025$

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?

Ans: **X = 2000 with highest probability of 0.3**

- (ii) Is the venture likely to be successful? Explain

Ans: **If venture can maintain for long term business then eventually it will be successful since the probability of non-negative return is greater than 0.5 and the expected value for return is a positive number.**

- (iii) What is the long-term average earning of business ventures of this kind? Explain

Ans: **$E(X) = \sum_{i=1}^n X_i \cdot P(X_i) = (0.1)(-2000) + (0.1)(-1000) + (0.2)(0) + (0.2)(1000) + (0.3)(2000) + (0.1)(3000) = 800$.**

- (iv) What is the good measure of the risk involved in a venture of this kind? Compute this measure

Ans: **Standard Deviation is the good measure of risk involved in venture of this kind.**