**Topics: Descriptive Statistics and Probability**

1. Look at the data given below. Plot the data, find the outliers and find out

|  |  |
| --- | --- |
| **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% |

# Sol:

* Outliers-91.36%.
* Mean- 33.27%
* Variance- 0.028715
* Standard Deviation- 0.169454



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

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

## Sol: Range from 5 to 12, Inter-quartile range = 12-5 = 7

1. What can we say about the skewness of this dataset?

## Sol: Dataset is Right skewness.

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

## Sol: The data point 2.5 lies within the box plot,would not be affected.

3.

Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

## Sol: The highest dataset lies in 4 and 8.

1. Comment on the skewness of the dataset.

## Sol: Right-skewed.

1. 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.

## Sol: Histogram has given the frequency distribution so we can see 50%of the dataset lies in between 4 and 8 which is right-skewed,

1. 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.)

## Sol: Let us define an event

## E-The call is Misdirected

## Then the probability of the event E is,

## P(E)= 1/200. (1-1/200)

## Q= 199/200.

## At least one call reaches the wrong number

## Probability that no call reaches the wrong number.

## =1 - (199/200 \* 199/200 \* 199/200 \* 199/200 \* 199/200)

## =1 – (199/200)2

## =0.02475124688

1. 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 |

1. What is the most likely monetary outcome of the business venture?

## Sol: The maximum of p is = 0.3 which is followed by x= 2000, So most likely the outcome of this business venture is 2000.

1. Is the venture likely to be successful? Explain

## Sol: Here p(x>0) = 0.6, Which clearly states that there is a 60% chance of this business would have profits greater than expected, considering p(x<0) = 0.2 which also states that loss is only 20%. So the venture is likely to be successful.

1. What is the long-term average earning of business ventures of this kind? Explain

## Sol: Most likely the outcome of the business venture is 2000 and the maximum probability = 0.3.

## E(x)P(x) and the expected value would be = = 800

## The long-term average earning of a business venture would be = 800

1. What is the good measure of the risk involved in a venture of this kind? Compute this measure

## Sol: 20% of the risk is involved in this business as it showed 0.1, 0.1 probability in p(x).