**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% |

Answer:- Mean of given data is 0.332713.

Median for given data is 0.2671.

Standard Deviation is = 0.163708.

Standard Deviation Square is = 0.0268.

Outliers is Morgan Stanley – 91.36%.



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.

Answer:- The inter-quartile range of this dataset is approximate 7.

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

Answer:- The Skewness of this dataset is Positively Skewed.

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?

Answer:- If the data point with the value 25 is actually 2.5 then the outlier which lies on the value

25 will be in the boxplot towards the lower extreme.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Answer:- The mode of this dataset lies in between 5 to 10.

1. Comment on the skewness of the dataset.

Answer:- Skewness of the dataset is Positively 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.

Answer:- Boxplot shows how many outliers are their also Interquartile range and skewness.

Whereas the histogram shows its mean , median and mode and how it varies with each.

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.)

Answer:- One in 200 long-distance telephone calls is misdirected =>  probability of call misdirecting  p = 1/200

     Probability of call not Misdirecting = 1 - 1/200 = 199/200

Number of Calls = 5

P(x) = nC \* p \* q \*^n-x

n = 5

p = 1/200

q = 199/200

at least one in five attempted telephone calls reaches the wrong number

= 1  -  none of the call reaches the wrong number

= 1  - P(0)

= 1   - (1/200) (199/200)^5

= 1  -  (199/200)^5

= 0.02475.

The probability that at least one in five attempted telephone calls reaches the wrong number 0.02475.

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?

Answer :- Max. P = 0.3 for P(2000). So most likely outcome is 2000.

1. Is the venture likely to be successful? Explain

Answer :- P(x>0) = 0.6, implies there is a 60% chance that the venture would yield profits or

greater.

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

Answer :- Weighted average = x\*P(x) = 900. This means the average expected earnings over a long

period of time would be 900.

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

Answer :- P(loss) = P(x= -2000)+P(x=-1000)=0.2. So the risk associated with this venture is 20%.