**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% |

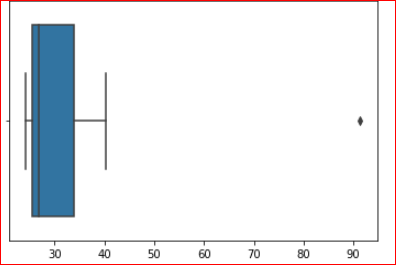
ANS: MEAN: 33.27

STANDARD DEVIATION: 16.94

VARIANCE:287.14

OUTLIER: 0.9136

Boxplot





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.

ANS: IQR = 12-5 = 7. The IQR is the difference between the 75th percentile and the 25th percentile.

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

ANS: The data is right 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?

ANS: The box-plot completely changes. The IQR and mean changes



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

ANS: The mode lies between 4 to 8 (approx.).

1. Comment on the skewness of the dataset.

ANS: The dataset is Right-skewed.

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: The boxplot gives Inter Quartile range of the data set and the histogram gives the range of data values. The box plot clearly shows the outliers and the histogram provides the mode of the dataset clearly.

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.)

ANS: Probability that call is misdirected = 1/200=0.005

Probability that call is not misdirected = 1-0.005=0.995

No. of calls = 5

Probability that at least one in five attempted telephone calls reaches the wrong number = P(X>=1) =1-P(x<1) =1-P (0) =1-nCxpqn-x = 1-5Co(0.005)0(0.995)5-0 = 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?

ANS: The most likely monetary outcome of the business venture is $2000 as it is having the highest probability.

1. Is the venture likely to be successful? Explain

ANS: Expected value= Σ x. P(x)=$800. As the expected value is positive, venture is likely to be successful.

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

ANS: Expected value = Σ x. P(x)=$800. The Long Term average earning of business is $800.

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

ANS: The standard deviation of the data measures the risk involved.

Hence Standard deviation = $1870.828