**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:** Solved in python file



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:** First quantile (Q1) = 5, Third quantile (Q3) =12

Inter quartile range = Q3 – Q1 = 7

In the given data both the inter-quartile range and median are same and equal to 7

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

**Ans:** In the plot we can see that most of the data lies in the right side, so it is right skewed data.

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:** in this situation no outlier exist because 2.5 is lies in between 0 and 2.5 or between lower limit and first quartile.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans:** Mode lie between 4 to 8

1. Comment on the skewness of the dataset.

**Ans:** Most of the data is on the right side, so it is right skewed data.

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.

**Ans:** Both the plots are 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.)

**Ans:** Solved in python file.

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:** most likely outcome is that, which has highest probability among the given data, so in this case is $2000 is the most likely outcome of 0.3 probability.

1. Is the venture likely to be successful? Explain

**Ans:** Probability of positive outcomes is = 0.2 + 0.2 + 0.3 + 0.1 = 0.8

Which is farther from 0.5 and nearer to the 1, so we can say that venture will succeed.

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

**Ans:** Expected value = (-2000\*0.1) + (-1000\*0.1) + (0\*0.2) + (1000\*0.2) + (2000\*0.3) + (3000\*0.1)

= $ 800

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

**Ans:** Calculated in python file.