**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% |

The box plot is attached in R. file.

The outlier point is 91.36% for the company Morgan Stanley

Mean =µ= 33%

Variance = 0.029

Standard deviation = 0.0169



1. Answer the following three questions based on the box-plot above.
2. What is inter-quartile range of this dataset? (please approximate the numbers) In one line, explain what this value implies.

Inter-Quartile Range = 12-5=7

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

Right Skewed Distribution

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?

If the data point 25 becomes 2.5, there will no outliers in the box-plot



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

The mode will lie close to 5

1. Comment on the skewness of the dataset.

It is right skewed distribution

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.

Both the graphs indicate that the data point 25 is the outlier

Mean > Median indicates that the distribution is skewed towards right

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.)

Probability of miss call = 1/200 =p

Probability of one successful call is 1-1/200=0.995=q

Probability that at least one in five attempted calls is wrong call = 1-0.995^5= 1-0.975 =0.02475 =2.5%

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?

Most likely outcome is 2000\*0.3 = $ 600

1. Is the venture likely to be successful? Explain

The venture is successful as there is high probability in positive investment.

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

Monetary Outcome = (-2000\*0.1)+(-1000\*0.1)+(0\*0.2)+ (0.2\*1000)+ (0.3\*2000)+ (0.1\*3000) =$ 800

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

The good measure of the risk involved = Standard deviation of return =sd(X) = 1870