**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: There is One Outlier: Morgan Stanley at 91.36%.

Mean=33.27133333333333

Variance = 287.1466123809524

Standard Deviation = 16.945400921222028



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= Q3 – Q1 = 12 – 5 = 7 , IQR represents middle 50% data.

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

Ans: Mean is less than median, so the box plot 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 new Box plot will have no outliers in it.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: Between 4-6 and 6-8

1. Comment on the skewness of the dataset.

Ans: Right skewed, as long tail towards Right.

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 Plots give idea about skewness of the data, But

1. Box plot provides outlier values, which fails to provide by histogram.

1. Similarly histogram provides the frequency of datapoints, which fails to provide by box plot.
2. 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: The probability of the event E is p(E)=1/200

Probability that at least on in 5 attempted call reaches the wrong number

= 1- P (B bar)

= 1- (199/200) ^5

= 0.025.

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: 2000

1. Is the venture likely to be successful? Explain

Ans: Yes, 60% chances of getting a positive return and 20% chance of negative returns or debts.

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

Ans: Long term returns = ((-2000\*1)+ (-1000\*1)+ (1000\*2)+ (2000\*3)+ (3000\*1) / 6) = 8000/6 = 1333

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

Ans: Good measure is, Positive returns (profits) probability tends to be more than negative returns (loss). i.e. 60% probability of profits and 20% probability of loss.