**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% |

**Sol:**

**Outlier = Morgan Stanley 91.36%**

**Mean = 33.27**

**Std. deviation = 16.94**

**Variance = 287.14**



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.

**Sol: Approximately 1st quartile range = 5**

**2nd quartile range = median = 7**

**3rd quartile range = 12**

**Therefore Inter Quartile range = 3rd – 1st = 12- 5 = 7**

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

**Sol: Median is towards the left, right skewed dataset**

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?

**Sol: There would be no outliers**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Sol: The mode of this data set would lie in between 5 to 10 with the frequency between 4 to 8**

1. Comment on the skewness of the dataset.

**Sol: Right 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.

**Sol: Both the datasets are right skewed. In histogram, mode can be easily found and in box plot median can be easily found**

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.)

**Sol: P of 1 call not misdirecting = 1 – 1/200 = 199/200**

**P of atleast 1 out of 5 calls reaching the wrong numbers = 199/200 P(x)**

**= p(1) = (5C1)(1/200)^1 (199/200)^5-1**

**= 0.0245**

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?

**Sol: As the probability of 2000 is greater. The most likely monetary outcome is 2000**

1. Is the venture likely to be successful? Explain

**Sol: yes. 80% chance of making profit**

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

**Sol: + 800**

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

**Sol: higher variance means more chances of risk**