**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:**

= 33.271

= 16.945

= 287.146

Outlier = 91.36



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

It means 50% of the data lies between the range of 5-12.

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

Ans:

The data is positively skewed distributed.

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:

2.5 will not be considered as outlier, so there would have been no outlier. The data set will be distributed between the range of 0 to 20. And the value of mean and median will slightly changd.



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 and 8.

1. Comment on the skewness of the dataset.

Ans: The dataset is positively skewed distributed.

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:

* We will get median in boxplot and mode in histogram.
* Boxplot provides the quantile distribution of data points and histogram provides the frequency distribution.
* And in boxplot we can easily find the outlier but in histogram we can’t find the exact outlier, but we can guess the outlier in histogram.

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: 0.0247

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 monetary outcome is 2000.

Because here the highest probability is for 2000 which is 30%.

1. Is the venture likely to be successful? Explain

Ans: Yes, because the total earning of the venture is 800 which is in positive. And there is 60% chance that the venture will give profit and only have 20% of loss.

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

Ans: Average earning = x\*p(x) = 800

So the average expected earning over a long-term period will be 800 including all losses and gains.

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

Ans: P(loss) = 0.1+0.1 = 0.2 = 20 %

So the risk involved with this venture is 20%