**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% |

|  |  |
| --- | --- |
|  | 0.332713 |
|  | 0.169454 |
|  | 0.028715 |
| Outlier | 91.36% |

Ans:



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: Given,

Q3= 12.5,

Q1 = 5

& IQR = Q3 – Q1

So, IQR = 12.5 – 5 = 7.5

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

Ans: It is right skewed and hence it is positively 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: If only the value of datapoint 25 changes into 2.5 then there would be no effect on boxplot, all will remain as it is only there would be data point where we can show the outlier which is present on 25.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: The mode of the dataset is between 5 to 10

1. Comment on the skewness of the dataset.

Ans: Positive or 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.

Ans: The outlier for both the boxplot and histogram is same and both are right or positive 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.)

Sol: Given,

1 in 200 telephone calls is misdirected.

Let’s x is the probability for 1 call which is misdirected out of 200

X = 1/200

Probability for the calls which are not misdirecting = 1 – 1/200 = 199/200

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 is the most likely monetary outcome because its probability is high.

1. Is the venture likely to be successful? Explain

Ans: Positive Return for Possibility is 0.2 + 0.3 + 0.1 = 0.6

No return is for 0.2

And negative return is for 0.1 + 0.1 = 0.2

So positive return is more in comparison to others which is 0.6, that’s the venture is likely to successful.

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

ANS: Average = (-2000\*0.1) +(-1000\*0.1) +(0\*0.2) +(1000\*0.2) +(2000 \*0.3) +(3000\*0.1) =800

So, the long-term average earning for these types of ventures would be around $800.

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

Ans: As by the chart, the good measure of loss is -2000 for 0.1 and -1000 for 0.1 so total is 0.2 and hence the loss is 20%.