**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% |



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: q3=12, q1=5, iqr = q3 – q1 = 7. It tells us spread of middle half of the distribution of datset.

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

Ans: Presence of outlier disrupts the mean in the dataset. In this case mean > median, so data 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 Then chances are that it will be normally distributed.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans. Around 4 to 8 of the values of Y.

1. Comment on the skewness of the dataset.

Ans. Looking at the distribution of the data set it is more likely 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.-

1. As we can see in the question 2 boxplot an extreme point was present in at 25 which is similar to this histogram.
2. Both histogram and boxplot are right skewed.
3. Presence of outlier higher scale shifts mean to larger values, which results in mean > median.

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.

Probability of one misdirected call out of 200 calls = 1/200

Probability of no misdirected call will be = 1 – (1/200) = 199/200

Probability of 5 consecutive call as a success = (199/200)^5

Probability of at least one misdirected in five attempts = 1-(199/200)^5 = 0.02475

Which is roughly 2.47%

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 monetary outcome of this business venture is $2000.

1. Is the venture likely to be successful? Explain

The probability of this venture to be successful will happened only when x values will be 0,1000,2000,3000 which is 0.2 + 0.2 + 0.3 + 0.1 = .8

80 % of chance that venture likely to be successful.

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

Expected value = -2000 \* 0.1 + -1000 \*0.1 + 0 \*0.2 + 1000 \* 0.2 + 2000 \* 0.3 + 3000 \* 0.1= 800

Long-term average earning of business ventures will be of $800.

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

Standard Deviation($1466.29) is a good measure of the risk involved in a venture of this kind.