**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.

Here Q1 = 5 and Q3 = 12.5 Then

IQR = Q3 – Q1

IQR = 12.5 – 5

IQR = 7.5

The whole 75% data is lies between 7.5 and the outliers will be found in the right side of data (Right skewness)

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

The data is right skewed (positive skewness)

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?

There will be no outliers affect the box plot



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

4.5 – 6.5

1. Comment on the skewness of the dataset.

The data is right skewed (the outliers lies on the right side ) – Positive skewness

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.

The Whole data has an outlier 25 and for skewness is the data is right skewed and the most of the data lies between the range of 4.5 – 12.5 (Approx)

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.)

To find the probability of having at least 1 misdirected call,We need to calculate:

P(X ≥ 1) = P(X = 1) + P(X = 2) + P(X = 3) + P(X = 4) + P(X = 5)

Probability of at least one misdirected call: 0.024751246878125

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?

The most likely monetary outcome of the business venture is the one with the highest probability, which is $2000.

1. Is the venture likely to be successful? Explain

The provided data represents a probability distribution of returns for a business venture. The monetary outcomes are rounded to the nearest $1,000. The distribution indicates that the most probable monetary outcome is $2000, with a probability of 0.3. There is a mix of potential gains and losses, but the higher probabilities associated with positive returns, particularly $1000 and $2000, suggest that the venture is more likely to be successful and yield profitable outcomes.

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

The long-term average earning can be calculated as follows:

Average Earning = (-2000 \* 0.1) + (-1000 \* 0.1) + (0 \* 0.2) + (1000 \* 0.2) + (2000 \* 0.3) + (3000 \* 0.1)

Average Earning = -200 - 100 + 0 + 200 + 600 + 300

Average Earning = 800

The long-term average earning of business ventures of this kind is $800.

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

Here the average earning is $800 (mean )

Then we need to calculate the standard deviation

Standard Deviation (σ) = √[ (-2000 - 800)^2 \* 0.1 + (-1000 - 800)^2 \* 0.1 + (0 - 800)^2 \* 0.2 + (1000 - 800)^2 \* 0.2 + (2000 - 800)^2 \* 0.3 + (3000 - 800)^2 \* 0.1 ]

Stdv = 3212.37

So A higher standard deviation indicates higher variability and therefore higher risk

potential outcomes.