**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. Mean() = 31.36

Variance() = 50.63

Standard Deviation () = 7.12



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. Inter-quartile Range(IQR)= Q1 – Q3 == 5 to 12.5

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

Ans. Positive Skew

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.

Correcting the value from 25 to 2.5 would significantly affect the box plot, shifting the upper whisker, maximum value, and potentially reducing the interquartile range



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans. Mode lies on 6

1. Comment on the skewness of the dataset.

Ans. Positive Skew

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.

By combining histograms and box plots, analysts can gain insights into both the detailed distribution of data values (histogram) and the overall summary statistics and key features of the distribution (box plot). This combination allows for a more comprehensive analysis of the dataset, enabling better-informed decisions and interpretations.

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 that at least one in five attempted telephone calls reaches the wrong number =

0.9024 ≈ 90.24%

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.** monetary outcome of the business venture = $700

1. Is the venture likely to be successful? Explain

**Ans.** we need to consider the probability of positive returns compared to negative returns. In this case, the probability of positive returns (outcomes $0, $1000, $2000, and $3000) is higher than the probability of negative returns (outcomes $-2000 and $-1000). Therefore, based on this information alone, the venture is more likely to be successful.

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

**Ans.** The long-term average earning of business ventures of this kind, or the expected value, is $700.

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

**Ans.** The variance of the business venture, which measures the spread of the distribution, is $2,210,000. This indicates the variability or risk involved in the outcomes of the venture. A higher variance suggests higher risk.