**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:

It represents the difference between the upperbond and lowerbond values in the shaded region only.

IQR=7

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

Ans:

The above boxplot is representing the right skewness or a positive skewness of the data.

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:

As we can see, the original value (2.5) is less than the existing value (2.5), as we can also observe that the boxplot is in a positive skewness, hence even after changing the existing value with the original value, the box pplot is not going to have more effect compared to the present boxplot diagram



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans:

The mode for the above histogram lies in the range of 4-8.

1. Comment on the skewness of the dataset.

Ans:

The skewness of the dataset is going to be positive skew as the long tail points are located on right side.

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:

Both the histogram and box plot are positive skewness, these graph offers a complete picture of the dataset. You can visually assess the skewness or symmetry of the data using the histogram, while the box plot provides a summary of the central location, variability, and potential extreme values.

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:

Given that

The probability of a single call being misdirected(p)=1/200

The probability of a single call being not misdirected (Q)=1-P

=1-(1/200)

=199/200

Now,

The probability of that non of one in five attempted telephone calls reaches the wrong number=(Q)^5

=(199/200)^5

The probability that one in five attempted telephone calls reaches the wrong number =1-(Q)^5

=1-(199/200)^5

=0.02475

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:

1. Is the venture likely to be successful? Explain
2. What is the long-term average earning of business ventures of this kind? Explain
3. What is the good measure of the risk involved in a venture of this kind? Compute this measure