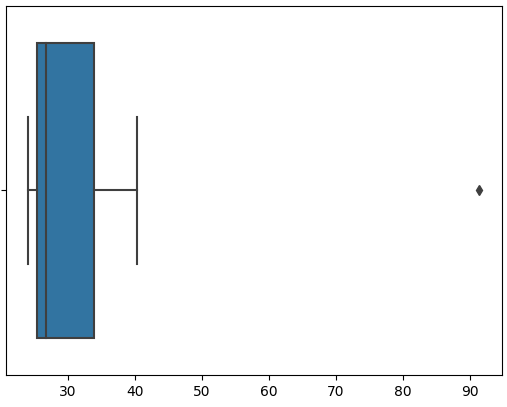
**Topics: Descriptive Statistics and Probability**

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% |



Mean = 33.271

Standard deviation = 16.945

Variance = 287.1466

Outlier = 91.36%



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: IQR = 75th percentile – 25th percentile = 12 – 5 = 7. This implies that 50% of the values lie between the range of 12 and 5.

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

Ans: Positive skewness/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: Existing plot shows that 25 is an outlier. If the value is changed to 2.5 then, the outlier will not be present in the dataset.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: Between Y values 4 and 8.

1. Comment on the skewness of the dataset.

Ans: 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 box plot represents the IQR, 25%, 75%, Median and outliers(if any) of a dataset.

The Histogram represents the frequency distribution of the dataset, over equally set intervals (such as 0-5, 5-10, 10-15, etc.). Both these plots show the skewness of a dataset and existence of any outliers.

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 misdirected calls = 1/200

Probability of non-misdirected calls = 199/200

For independent attempts, probability of 5 calls not-misdirected = (199/200)^5

Probability of one in 5 calls is misdirected = 1-((199/200)^5) = 0.975

= 97.5 %

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: $2,000

1. Is the venture likely to be successful? Explain

Ans: Yes. As the distribution shows that the probability for positive returns are higher than the loss.

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

Ans: Average earning = sum of product of x and P(x)

= $ 800

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

Ans: Standard deviation.

Standard deviation = 1870.83