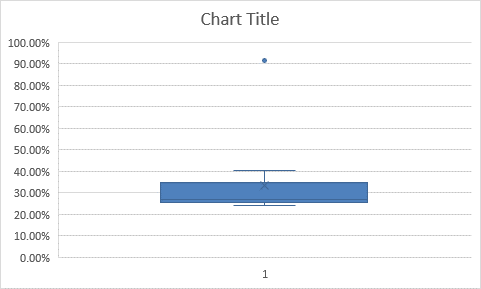
**Topics: Descriptive Statistics and Probability**

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:



|  |  |
| --- | --- |
| **mean** | 33.27% |
| **std dev** | 0.163708 |
| **variance** | 0.0268 |

Outlier- morgan stanley 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.

7 (approx.)

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

not symmetric, right skewed distribution

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?

If the data point with the value 25 is corrected to 2.5, the new box plot would be affected significantly. The scale of the y-axis would be compressed, potentially making the spread of the dataset appear smaller and the distribution less skewed.

1. Top of Form



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

In range between 5-10

1. Comment on the skewness of the dataset.

Asymmetric and skewed to the left meaning most value lie in the left of the graph

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.

Asymmetric graphs and plot, both have median lying between range 5 to 10. An outlier around point 25 on x axis. Data range is variable and spread across the plot and graph. And it is left skewed.

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.)

Let p be the probability of a call being correctly directed, which is 199/200.

For 5 corrected call prob = (199/200)^5

Wrong call prob = 1- (199/200)^5 ≈0.97525

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?
2. Is the venture likely to be successful? Explain

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

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

(i) The most likely monetary outcome (profit) of the business venture can be determined by identifying the outcome with the highest probability. From the given probability distribution, the outcome with the highest probability is $2000, with a probability of 0.3.

(ii) Yes, the venture is likely to be successful. This conclusion is based on the fact that the probabilities associated with profitable outcomes (positive returns) are higher compared to the probabilities associated with non-profitable outcomes (negative returns). Specifically, the probabilities of profitable outcomes (0, 1000, 2000, and 3000) sum up to 0.8, indicating an 80% chance of making a profit.

(iii) The long-term average earnings of business ventures of this kind can be calculated by multiplying each monetary outcome by its respective probability and summing up the products.

Long-term average earnings= (-2000)(0.1) + (-1000)(0.1) + (0)(0.2) + (1000)(0.2) + (2000)(0.3) + (3000)(0.1)

Long-term average earnings = -200 - 100 + 0 + 200 + 600 + 300 = 800

The long-term average earning is $800. This value represents the average profit (or loss) that can be expected over the long run in similar ventures of this kind. It is obtained by considering the weighted average of all possible outcomes based on their probabilities.

(iv) A good measure of the risk involved in a venture of this kind is the standard deviation of the probability distribution. The standard deviation provides a measure of the dispersion or variability of the outcomes around the mean.

Standard deviation= under root(Variance) ​=(1752000)/(1/2)​≈ 1324.6