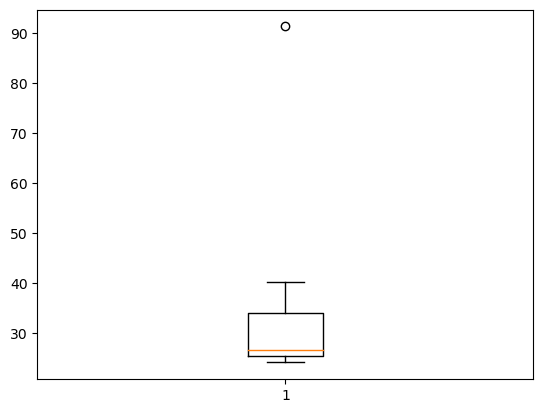
**Topics: Descriptive Statistics and Probability**

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:

Outlier=91.36 (Morgan Stanley)

Mean= 33.271

Standard Deviation= 16.945

Variance=287.146



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.
2. What can we say about the skewness of this dataset?
3. 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:

1. IQR = 12-5 = 7 The median is the second quantile range.
2. The data is Right skewed because median is towards the left side.
3. There will be no outliers in the data and there wont be any skewness. The data will become normally distributed.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?
2. Comment on the skewness of the dataset.
3. 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:

1. The will lie approximately between 5 to 10.
2. Here the mean>median>mode. So it is Right Skewed
3. Both box plot and the histogram have outliers and both are rightly skewed. In boxplot we can visualize median perfectly whereas in histogram we can see mode.
4. 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 call misdirecting (p) =

Probability of call not misdirecting (p) = 1- =

Number of calls (n)= 5

P(x) = ⁿCₓpˣqⁿ⁻ˣ

Probability that atleast one in five attempted phone calls reaches the wrong number = 1 - P(0)

= 1 - 5C0(1/200)0(199/200)5-0

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

Ans:

1. The most likely monetary income is $2000 because its probability is 0.3 and is maximum.
2. Yes, the probability that the venture will make profit is = 0.2+0.2+0.3+0.1 = 0.8. The venture will have 80% of chance to gain profit.
3. The long-term average is Expected value = Sum (X \* P(X)) = 800$. He will get a profit of about $800
4. Variance(X) = E(X2)- (E(X))2 = 2800000 - 640000 = 2160000

Higher the variance, higher the risk involved. The good measure of risk involved is the variability of distribution.