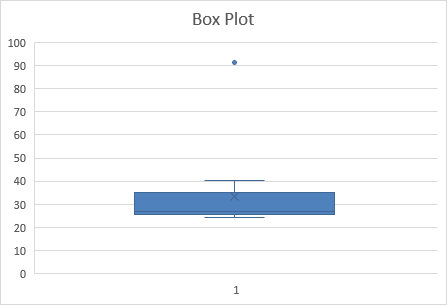
**Topics: Descriptive Statistics and Probability**

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(µ)= 33.27133

Standard Deviation()= 16.9454

Variance(2)= 287.1466

Outliers= 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: First Quartile Range Q1= 5

Third Quartile Range Q3= 12

Inter Quartile Range = Q3-Q1 = 12-5= 7 which is also the second quartile range and the median value for the box plot.

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

Ans: The box plot is positively skewed. The tail is extending towards right side.

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: There would be no outliers on the dataset because the outlier the data had positive skewness.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: The mode of the data set lies between 4 to 10.

1. Comment on the skewness of the dataset.

Ans: The data is positively skewed.

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 data are positively skewed and both have outliers with the value 25. In box plot , the median is clearly visible whereas in histogram mode is more visible.

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: X = Probability of one call misdirected out of 200

Probability of 1 in 200 long telephone calls getting misdirected=p=1/200

P(X)=1/200

Probability of call not misdirecting=q= 1- 1/200 = 199/200

The probability for at least one in five attempt telephone calls reaches wrong number

= 5n

P(X)= (nCr)(p^r)(q^n-r)

P(1)= (5C1) (1/200)^1 (199/200)^5-1

P(1)= 0.02475 = 2%

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: The most likely monetary outcome of business venture is 2000$ because the probability

for 2000$ is 0.3

1. Is the venture likely to be successful? Explain

Ans: Yes, the probability of the venture is more likely to successful as

P(x>0)+P(x>1000)+P(x>2000)+P(x=3000)= 0.2+0.2+0.3+0.1= 0.8

That means there is 80% of chances to make this venture successful.

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

Ans: The long term average = sum(x\*p(x))

= (-2000\*0.1)+(-1000\*0.1)+(0\*0.2)+(1000\*0.2)+(2000\*0.3)+(3000\*0.1)

= 800

Therefore, the long term average earning of business ventures is around $800.

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

Ans: The good measure of the risk involved in a venture of this kind depends on the variance and standard deviation of the variable x.

Var= 3500000

Std= 1870.83

The higher the variance, the chances of the risk will be more. The large value of standard deviation of $1870 is considered along with the average returns of $800 shows that the venture is highly risky.