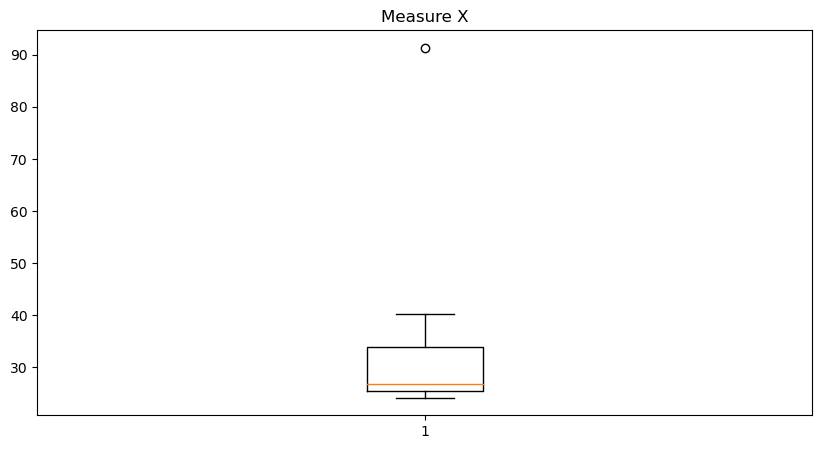
**Topics: Descriptive Statistics and Probability**

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:**

|  |  |
| --- | --- |
|  | **Measure X** |
| **mean** | 33.271333 |
| **Variance** | 287.14661 |
| **Standard Deviation** | 16.945401 |





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**: If we assume approximately (First Quantile Range) Q1 = 5 (Third Quantile Range) Q3 = 12, Median (Second Quartile Range) = 7 then

(Inter-Quartile Range) IQR = Q3 – Q1 = 12 – 5 = 7

Second Quartile Range is the Median Value

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

**Ans**: This data is not normally distributed; it has right side skewness with one outlier.

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**: If we remove the 25 from the data set and make it as 2.5 then the only outlier 25 will be removed. And it also reduces some skewness in the dataset.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans**: The mode of this data set lie in between 5 to 10 and approximately between 4 to 8.

1. Comment on the skewness of the dataset.

**Ans**: Dataset having right side 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.

**Ans**: They both are right-skewed and both have outliers the median can be easily visualized in box plot where as 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**: 1 in 200 long-distance telephone calls is misdirected

- probability of call misdirecting p = 1/200

- Probability of call not Misdirecting = 1 - 1/200 = 199/200

- Probability of call Misdirecting 5 times = 1 - (199/200) 5 times = 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**: Max. P = 0.3 for P(2000). The most likely monetary outcome of the business venture is 2000$ As for 2000$ the probability is 0.3 which is maximum as compared to others

1. Is the venture likely to be successful? Explain

**ANS**: P(x>0) = 0.6, implies there is a 60% chance that the venture would yield profits or greater than expected returns. P(Incurring losses) is only 0.2.

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

**ANS**: Weighted average = x\*P(x) = 8000. This means the average expected earnings over a long period of time would be 8000(including all losses and gains over the period of time)

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

**ANS**: P(loss) = P(x= -2000)+P(x=-1000)=0.2. So the risk associated with this venture is 20%.