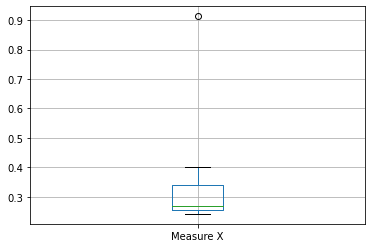
**Topics: Descriptive Statistics and Probability**

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% |



* Outlier = Morgan Stanley 91.36%
* µ = 0.332713
* σ = 0.169454
* σ2 = 0.028715



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.

* IQR Range = 5 – 12 (Approx)
* The values in IQR are the middle 50% when arranged in ascending order.

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

* Positive skew

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?

* There wouldn’t be any outliers and the data point with the value 2.5 would fall under the first quartile.

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Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

* Mode of the dataset lies between 4 and 8.

1. Comment on the skewness of the dataset.

* Positive 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.

* Histograms and boxplots are very similar as they both help to visualize and describe numeric data.
* Histograms are better in determining the underlying distributionof the data whereas boxplots allow you to compare multiple data sets better than histogram.

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.)

* Probability of calls misdirected, p = 1/200

Probability of calls not misdirected, q = 1-1/200=199/200

No:of calls, n = 5

P(x) = nCx px qn-x

Atleast one in five calls reach wrong numbers = 1-none of the calls reaches wrong number

=1-P(0)

=1-5C0 p0 q5-0

=0.0247

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?

* For x=2000, P(x)=0.3. Therefore, most likely the outcome will be 2000.

1. Is the venture likely to be successful? Explain

* P(x>0) = 0.6, there are 60% chances that the business would yield profits, or more than expected returns. It has 20% chances of making loss. Therefore, the is likely to be successful.

1. What is the long-term average earning of business ventures of this kind? Explain
2. What is the good measure of the risk involved in a venture of this kind? Compute this measure

* P(loss) = P(-2000) + P(-1000)=0.2

Therefore, the risk associated with this venture is 20%.