**Topics: Descriptive Statistics and Probability**

1. Look at the data given below. Plot the data, find the outliers and find out

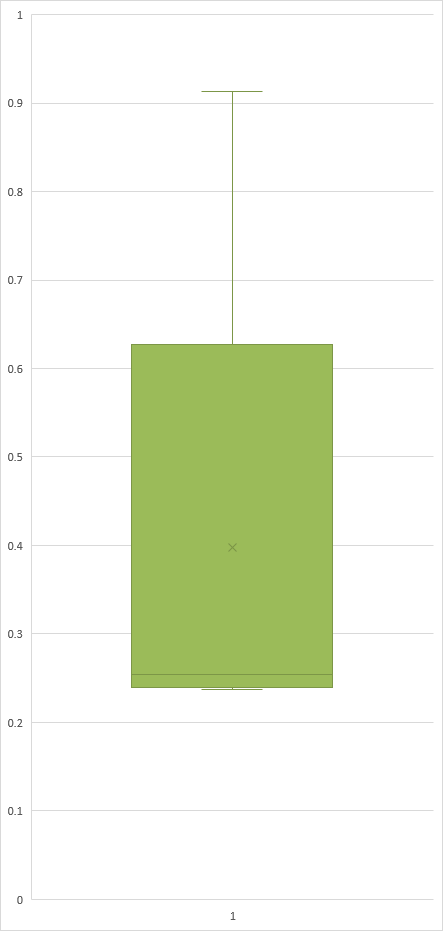
|  |  |
| --- | --- |
| **Name of company** | **Measure X** |
| Allied Signal | 24.23% |
| Bankers Trust | 25.53% |
| General Mills | 25.41% |
| ITT Industries | 24.14% |
| J.P.Morgan & Co. | 29.62% |
| Lehman Brothers | 28.25% |
| Marriott | 25.81% |
| MCI | 24.39% |
| Merrill Lynch | 40.26% |
| Microsoft | 32.95% |
| Morgan Stanley | 91.36% |
| Sun Microsystems | 25.99% |
| Travelers | 39.42% |
| US Airways | 26.71% |
| Warner-Lambert | 35.00% |

**Solution :** (solved using excel)

**Mean µ =** 0.296

**Standard deviation** [**σ**](https://en.wikipedia.org/wiki/Sigma)= 0.169

**Variance** [**σ**](https://en.wikipedia.org/wiki/Sigma)**²** = 0.287





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?

**Solution :**

(i) IQR = 12-5 = 7

IQR represents 50% data.

(ii) Right Sknewed.

(iii) The outlier will not be there in the new boxplot.

3.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Answer** **:** Mode lies between (4,6) and (6,8) bins.

1. Comment on the skewness of the dataset.

**Answer :** Right 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.

**Answer:** (i) Box plot provides outlier values, which fails to provide by histogram.

(ii) Similarly histogram provides the frequency of datapoints, which fails to provide by

box Plot .

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.)

**Solution:**

Let ,

W be the call that is misdirected

probability of the event W is,

P(W)= 1/200

Then,

Probability that at least one in 5 attempted call reaches the wrong number.

= 1 - Probability that no attempted call reaches the wrong number.

= 1 – P(W bar)

= 1 – (199/200)\* (199/200)\* (199/200)\* (199/200)\* (199/200)

**= 0.2475**

5.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?

**Answer: 2000**

1. Is the venture likely to be successful? Explain

**Answer:** p(x)=0.1+0.2+0.3\*100

**= 60**

since,there is 60% chance (i.e more than 50% ),we can say the venture is successful.

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

**Answer:** Expected valueor

long-term average = ((-2000\*0.1)+ (-1000\*0.1)+ (1000\*0.2)+ (2000\*0.3)+

(3000\*0.1))

**=800**

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