**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) **Attached with python file**



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**) INTER QUARTILE RANGE = 12-5=7

The IQR is seven because the 3rd quartile is 12 and the 1st quartile is 5, in order to find the IQR we need to calculate the difference between 3rd and 2nd quartile.

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

**Ans**) We can say the dataset as right skewed.

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 the data point is 2.5 instead of 25 there will no outliers and it will be normally distributed .





Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans)** If the distribution of data is skewed to the right, the mode is often**less than the median**, which is less than the mean. So the mode will be between 5-10.

1. Comment on the skewness of the dataset.

**Ans)** Dataset is 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.

**Ans)** Histogramhelps us in understand the distribution of data

Whereas box plot helps us in finding the outliers in the given dataset.

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) Let Probability of occurring 1 call misdirected out of 200 long distance calls as event A.

**P(A) = 1/200**

Therefore , probability of one call placed successfully **= 1-P(A).**

**= 1-1/200**

**= 199/200**

**=0.967**

As every event is independent to each other = **1-0.967\*5**

= **2% chance**

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 |

Ans) expected values of business venture =

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

(-200)+-(-100)+(0)+( 200)+(600)+(300)

= **800**

1. What is the most likely monetary outcome of the business venture?

Ans) the most likely monetory outcome of the business venture will be at **2000**,

Because it has the highest probability of **0.3.**

1. Is the venture likely to be successful? Explain

Ans) **YES**, Venture may be succesfull as we got the expected value **+800** .

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

Ans) **800**

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

Ans) **1707.82**