**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:- There is an outlier on higher side of data set.

**Mean=33.271**

**Variance=268.004**

**Standard deviation=16.3708**



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:- **IQR range is from 5 to middle of the 10-15, This value implies 50% data set of all..**

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

Ans:- **Right skewed, more data is on left tail.**

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:-median and mean of data set will be shifted toward lower quartile and data weight on left tail will increase.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans:- **Mode will be near to 5 on value axis**

1. Comment on the skewness of the dataset.

Ans:- **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:- **Both show dataset is right skewed, Both show data has outlier on higher values.**

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**:- One in 200 call gets misdirected=1/200=0.5.**

**There is 0.5% probability of every call gets misdirected.**

**Hence, we can say for 5 call=5\*0.5=2.5% probability is there that one call will get misdirected.**

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:- **x=2000 has the highest probability 0.3 so this will be the most likely monetary outcome.**

1. Is the venture likely to be successful? Explain

Ans:- **total outcome=-200-100+0+200+600+300=800,**

**This business will be successful because we have positive outcome.**

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
2. Ans:- **variance is very high so risk will be very high also.**

**Standard deviation:- df.std()=268.741**