**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% |

A:

**= 33.271333**

**σ2 = 287.14661**

**σ= 16.9454**

**Morgan Stanley is Outlier = 91.36**



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?

***A:***

1. ***Uppar IQR = 1.5+(12-5) = 8.5***
2. ***Lower IQR = 1.5 – (12-5) = 6.5***
3. ***The above dataset is positive skewness because it is right skewed***
4. ***There will be no outlier.***



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?
2. Comment on the skewness of the dataset.
3. 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.

**A :**

1. **Mode is 4-8**
2. **The data is present in left side ,it is a positive skewness.**
3. **Histogram is used for finding skewness,kurtosis,mode and Boxplot is used to find IQR and outliers.**
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.)

**A:**

**One of wrong number 200**

**Probability of wrong number = 1/200 = 0.005**

**Probability of not getting wrong numbder = 1-0.005 = 0.995**

**Probability of atleast one out of five is a wrong number**

**1-Probability of atleast one out of five calls are not wrong numbers**

**1-(1-0.005)^5**

**1-0.975**

**0.025**

**2.5%**

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?
2. Is the venture likely to be successful? Explain
3. What is the long-term average earning of business ventures of this kind? Explain
4. What is the good measure of the risk involved in a venture of this kind? Compute this measure

**A :**

1. **Most likely monetary outcome of business venture is 0.3**
2. **Yes,venture is successful**

**P(x = 1000)+p(x=2000)+p(x=3000) = 0.2+0.3+0.1 =0.6**

1. **0.1(-2000)+0.1(-1000)+0(0.2)+0.2(1000)+0.3(2000)+0.1(3000) = 800**
2. **The good measure of the risk involved in a venture of this kind is standard deviation.**