**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% |

**=>**

**μ= 33.27**

**=16.94**

**=287.14**

**Outliers=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.

* **IQR=Q3-Q1=12-5=7**

**It means 50% of data points lie in the range of 5 and 12.**

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

* **The dataset is positively skewed. Tail is found extending towards right side of the curve**.

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?

* **The median value will remain same, but the interquartile range will change.**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

* **Between bins 4-6 and 6-8.**

1. Comment on the skewness of the dataset.

* **Right skewed, as long tail towards right.**

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.

* **Both plots given idea about skewness of the data, But**

1. **Box plot provides outlier values, which fail to provide by histogram.**
2. **Similarly, histogram provides the frequency of datapoints, which fails to provide by box plot.**
3. 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.)

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

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

**=1-P (E bar)**

**=1-(199/200)^5**

**=0.025**

**Therefore, that a least one in 5 attempted call reaches the wrong number is 0.025.**

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?

* **2000**

1. Is the venture likely to be successful? Explain

* **Yes, there are 60% chances of getting a positive return and 20% chances of negative returns or debts.**

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

* **Long term returns= ((-2000\*1) + (-1000\*1) + (1000\*2) + (2000\*3) + (3000\*1) / 6) = 8000/6 = 1333**

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

* **Good measure is, positive returns(profits) probability tends to be more than negative returns(loss).**

**i.e., 60% probability of profit and 20% probability of loss**