**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% |



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 = 12-5 = 7 ,this represent the range which contains 50% of data points**

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

**Ans-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- 2.5 will not considered an outlier.boxplot will start from 0 and send at 20 in representation**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans- Mode lies between 4 and 8**

1. Comment on the skewness of the dataset.

**Ans- It 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- Median in Boxplot And mode in Histogram**

**Histogram provides the frequency distribution so how how many times each data point is occurring**

**Boxplot provides the quantile distribution that is 50 % of data lies between 5 and 12**

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
2. 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 long distance calls is misdirected

Probability of call misdirecting = 1/200

Probability of call not misdirecting = 1-1/200 = 199/200

**No of calls=5,**  **p(x) = ncxp^xq^n-x , n=5,p=1/200,q=199/200**

**At least one in five attempted telephone calls reaches the wrong no.**

**1-none of the calls reaches the wrong no. = 1-p(0)**

**= 1 -  ^5c0(1/200)^0(199/200)^5-0**

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

**= 0.0247**

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 – maximum value for p is 0.3 that’s why most likely monetary outcome is 2000**

1. Is the venture likely to be successful? Explain

**Ans- P(x>0) = 0.2+0.3+0.1 = 0.6 implies there is a 60% chance that the venture would yield profits or greater than expected returns.and loss is only 0.2% therefore the venture is likely to be successful**

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

**Ans-Weighted avg = x\*P(x) = 800. Means the avg expected earning for the long period of time would be 800**

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

**Ans -P(loss) = P(x= -2000)+P(x= -1000) = 0.2 so the risk associated with this venture is 20%**