**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- Outlier –: 91.36%

-: 33.27

-: 16.94

-: 287.14



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.

Answer: Inter Quartile Range (IQR) = Q3-Q1

= 12-5

= 7

Inter Quartile Range (IQR) is 7

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

Answer: The given dataset is having positive skewness.

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?

Answer: In the box plot there will be no outlier.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Answer: The mode of the dataset is lie between 4-8.

1. Comment on the skewness of the dataset.

Answer: The dataset having positive skewness.

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.

Answer: A histogram takes only one variable from the dataset and shows the frequency of each occurrence. I will use a simple dataset to learn how histogram helps to understand a dataset. A boxplot shows the distribution of the data with more detailed information. It shows the outliers more clearly, maximum, minimum, quartile(Q1), third quartile(Q3), interquartile range (IQR), and median. You can calculate the middle 50% from the IQR. From boxplot and histogram we can get too much information about dataset and we can develop our data from above boxplot and histogram.

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.)

Answer - One in 200 long-distance telephone calls is misdirected

probability of call misdirecting p = 1/200

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

Number of Calls = 5

P(x) = n^Cₓp^nq^n-x

n = 5

p = 1/200

q = 199/200

at least one in five attempted telephone calls reaches the wrong number

= 1 - none of the call reaches the wrong number

= 1 - P(0)

= 1   - 5^C0(1/200)(199/200)^5-0

= 1 - (199/200)^5

= 0.02475

**probability that at least one in five attempted telephone calls reaches the wrong number = 0.02475**

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?

Answer: The most likely monetary outcome if the business venture is 2000 as the p(x) is 0.3 which higher than p(x)

1. Is the venture likely to be successful? Explain

Answer: If we add profit p(x) like (0.2+0.3+0.1) = 0.6

So we can say it is successful near about (60-80) %

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

Answer: The long term earning will be approximately $500 for this kind of ventures.