**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** : Outlier = 91.36

287

16.9

1. 

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** : From the box plot : Q3=12 , Q1=5

IQR= Q3-Q1= 12-5 = 7

This value implies measure of spread.

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

**Ans** : The nature of skewneess of the data is neagtive which implies that mass of the distribution of the data is concentrated on the right.

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** : If that the data point with the value 25 is actually 2.5, then the new boxplot will not have any outlier and it will be normally distributed.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans** : Mode will be 22.

1. Comment on the skewness of the dataset.

**Ans** : The nature of skewneess of the data is neagtive which implies that mass of the distribution of the data is concentrated on the 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.

**Ans** : From boxplot and histogram, we can verify that the outlier and skewness of the data which comes same for both the graph. The insight about date which can be inferred from one graph complements the data from the other grapgh.

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 call is misdirected out of 200

Probability of misdirected call, P(MDC) = 1/200 = 0.005

Probability of not misdirected call, P(NMDC) = 1 – P(MDC) = 1 – 0.005 = 0.995

Probability of at least one out of 5 is a misdirected call = 1 – probability that all 5 calls are not misdirected

= 1 – (1 – P(MDC))^5

= 1 – (1- 0.005)^5

= 1 – 0.975

= 0.024

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** : The most likely monetary outcome of the business venture: 𝑥 = 2,000with the highest probability of 0.3

Is the venture likely to be successful? Explain

**Ans** : If the venture can maintain for long term business then eventually it will be successful since the probability of non-negative return is higher than 0.50 and the expected value for return is a positive number (800)

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

**Ans** : The -term average earning = −2000 ∗ 0.1 − 1000 ∗ 0.1 + 0 + 1000 ∗ 0.2 + 2000 ∗ 0.3 + 3000 ∗ 0.1 = 800.

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

**Ans** : The good measure of the risk involved in a venture of this kind is standard deviation.