**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% |

* There is outlier on upper quartile
* = 0.332713 , = 0.169454 , = 0.028715



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.

* Q3(Upper Quartile): 13 , Q1(Lower Quartile): 5
* IQR = Q3 – Q1 = 8
* It tells us that the distance between the upper quartile (Q3) and the lower quartile (Q1) is 8 units.

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

* The data is positively 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?

* The maximum value of the dataset would change from 25 to the next highest value, which means 20 would be the highest value. This would result in a shorter right whisker.
* The box would also get shorter
* May be the outlier would shift to lower quartile



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

* Mode lies between 4 to 8 value

1. Comment on the skewness of the dataset.

* It is positively 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.

* Histogram tells us that data is positively skewed and boxplot clearly inform us that there is outlier present on upper quartile

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.)

* Probability that at least one in five attempted calls is misdirected: 0.0248

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?

* The highest probability is 0.3, which occurs when x = 2000. Therefore, the most likely monetary outcome of the business venture is $2,000.

1. Is the venture likely to be successful? Explain

* The venture is likely to be successful because there is a 60% chance of earning a positive return(i.e., P(x>0) = 0.2 + 0.2 + 0.3 = 0.7)

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

* The long-term average earning of business ventures of this kind can be calculated by multiplying each possible return by its probability and summing the results
* (-2000)(0.1) + (-1000)(0.1) + (0)(0.2) + (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

* The good measure inshort we have to calculate standard deviation which is 1870.82