**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:**

**Inter quartile range(IQR) = Q3 – Q1**

**= 12-5**

**= 7**

* **Inter quartile range represents the middle of data or the 50% of data.**

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

**ANS: From data set we can say that dataset is Positively or Rightly 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 : Then there will be no outliers.**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**ANS : Mode of the above shown dataset would be in between bar 4 to bar 6 & bar 6 to bar 8.**

1. Comment on the skewness of the dataset.

**ANS : Above shown dataset is positively or rightly 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: From both of the graphs we can get idea about skewness & its positively skewed.**

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: Let us consider X be the call is misdirected,**

**Then the probability of event X must be,**

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

**Therefore,**

**According to condition in question at least one in five attempted call reaches to the wrong**

**Number,**

**Prob. = 1 – Probability that no attempted call reaches the wrong number**

**= 1 – P(X bar)**

**= 1 – (199/200)\*(199/200)\*(199/200)\*(199/200)\*(199/200)**

**= 1 – 0.975**

**= 0.025**

**0.025 is the probability that at least one in five attempted call reaches to the wrong number**

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: 2000**

1. Is the venture likely to be successful? Explain

**ANS : Yes there are 80% chance to get positive return.**

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

**ANS : Long term average earning of business ventures is around 800$.**

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

**ANS : Risk stems from the possible variability in the expected returns. Therefore, a good measure to evaluate the risk for a venture of this kind would be variance or standard deviation of the variable X.**

**Standard Deviation = 1870.829**

**Variance = 3500000**

**The large value of standard deviation of $1870 is considered along with the average returns of $800 indicates that this venture is highly risky.**