**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% |

**Outlier is morgan stanley.**

**Mean , =33.27133%**

**Std dev , =16.37%**

**Variance = 268**



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 is 12-5 = 7**

**This implies that middle 50% data lies in the range of 7 distance from 5 to 12.**

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

**Ans) the skewness is positive , that is it is tight tailed.**

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) there would be no outliers in new boxplot.**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans)** **between 5 to 7**

1. Comment on the skewness of the dataset.

**Ans) right skewed distribution**

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 the above 2 graphs , we can easily understand about the nature and frequency of outliers. Boxplots shows the median of the dataset while histogram gives the mode of the dataset vividly. We can also easily get the nature of skewness from this graphs .**

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) probability of misdirected calls = 1/200**

**probability of at least one in five calls reaches the wrong number = 5\*1/200**

**= 0.025**

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 , because there is a 60% probability of getting returns and there is only 20% chance of**  **getting loss and remaining 20% probability of neither loss nor profit. So probability of profit is**  **larger .**

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

**Ans) long term average earnings = (-2000+\*.1)+(-1000\*.1)+(1000\*.2)+(2000\*.3)+(3000\*.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 depends on the Variability in the distribution. Higher Variance means more chances of risk**

**Var (X) = E(X^2) –(E(X))^2**

**= 2800000 – 800^2**

**= 2160000**