**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% |

Soln:

1. Outlier – 91.36%
2. Mean = 33.2713%
3. Std = 0.169454
4. Var= 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.

Ans: IOR – 7 , this value implies that 50% of the data lies between 5 and 12 .

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

Ans: The dataset 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?

Ans: There would be no outlier in the data set but the data would still be positively skewed and have almost same IOR.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans : The mode of the dataset is in between 4 to 10 data set .

1. Comment on the skewness of the dataset.

Ans : The data is positively/Right 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 : Both these graphs show the concentration of the data is towards left(i.e., positive skewness) and both the graphs show the outlier as 25 . Histogram is better to display distribution of data.

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 call Misdirecting  p = 1/200

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

Probability that a t least one in 5 attempted call reaches the wrong number is

= 1-(199/200)5

=0.02475 ≈ **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: X = 2000 as it has highest probability of 0.3 .

1. Is the venture likely to be successful? Explain

Ans : Yes as probability of Positive sales is 0.6 , which is a good probability for a business to be successful.

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

Ans : The long-term average earning of business ventures is 800

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

Ans : : 0.08164966