**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% |

*Mean=33.27%*

*Std dev=0.169*

*Var=0.028*



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.

*Interquartile range defines the value that falls between 25th percentile and 75th percentile. Here, IQR is (12-5)=7*

1. What can we say about the skewness of this dataset? *It is Positively skewed*
2. 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 new boxplot will have no outlier then and the IQR value would increase and the graph becomes more positively skewed.*



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie? *Between 4 and 8*
2. Comment on the skewness of the dataset. *The graph is positively skewed*
3. 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 will clearly give us the mode of the distribution while any outlier will be easily identified by boxplot.*
4. 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.)

Let E be an event defined “the call is misdirected”

P(E)=1/200

P(E’)1-1/200=199/200

Prob that at least one in 5 attempted call reaches the wrong number

=1-prob that no attempted call reaches the wrong number

=1-(199/200)^5

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? 800
2. Is the venture likely to be successful? Explain Yes, because the value $800 will be near to $1000
3. What is the long-term average earning of business ventures of this kind? Explain

$133.33 is the long term average earing as it is the mean of the probability distribution

1. What is the good measure of the risk involved in a venture of this kind? Compute this measure. $294.392 is the good measure of risk involved as it is the standard deviation of the probability distribution