**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: (First Quartile Range)Q1=5 Mean=7

(Third Quartile Range)Q3=12

Inter-Quartile Range =Q3-Q1

=12-5

Inter-Quartile Range =7

Inter-Quartile range (second quartile Range)is median value.

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

Ans: Data is Right Skewed and median is towards a left side of data,its not a normal

Distribution.

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: 1.There is no outlier present in data.

2.Right skewed is swifted to the normal distribution,because outlier value is changed .



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: Mode of this data set lies between 4 to 8.

1. Comment on the skewness of the dataset.

Ans: Histogram is right skewed because of Outlier .mean>median>mode.

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 graphs has outlier and Both are Right skewed,median can easily visualize in box plot and mode in Histogram .

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 getting misdirected P(E) = 1/200

Prob of call not getting misdirected = 1 – P(E) = 199/200

No of attempts = 5

Prob that atleast one in 5 attempts misdirected calls P(X) = 1- – (prob that no calls misdirected in 5 attempts) P(X) = 1 – ((199/200)\*(199/200)

(199/200)\*(199/200) (199/200)) = 1 –((199/200)\*\*5) = 1 - 0.975248753121875

P(X) =0.02475124687812502 or approx. = 0.025 (Answer)

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 is a hight probability occurance.Hence $2000 is the most likely monetary outcome of the business venture.

1. Is the venture likely to be successful? Explain

Ans: Yess, the business venture is to be successful.Cause,

The Probability of successful outcome=0.2+0.3+0.1=0.6.

The probability is 60% percentage.

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

Ans: E(x)=(-2000\*0.1)+(-1000\*0.1)+(0\*0.2)+(0.2\*1000)+(0.3\*2000)+(0.1\*3000)

=$800

The long-term average earning of business ventures of this kind would be around $800

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

Ans: A good measure to evaluate the risk would be variance and standard deviation of the variable x

variance = 3500000

standard deviation = 1870.83

The highly risk involved in a venture is about $1870.