**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% |
|  |  |

Ans: Mean: 33.27133333333333

Variance: 287.1466123809524

Standard deviation: 16.945400921222028



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: Between 13-5=8 is inter-quartile range. This values implies that about 50% of values in data set store in this range.

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

Ans: skewness of this dataset is positive because it is slightly skewed to left.

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: AS if now outliers are present in extreme right (maximum) position it will affect the mean of given dataset. If 25 is actually 2.5 then outliers will be present in extreme left (minimum) position.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: Left.

1. Comment on the skewness of the dataset.

Ans: Positive.

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: Boxplot provides information about the outliers, inter-quartile range, range.

Histogram provides information about mean, median, nature of skewness of the data, nature of kurtosis of the 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.)

Answer: Given that once in 200 long distance telephone calls is

misdirected.so,

P(call misdirected)=1/200

P(call not misdirected)=199/200

At least one in five attempted telephone calls reaches the wrong number

=1-none of the call reaches the wrong number

=1-P(0)

=1-5C0(1/200)^0(199/200)^5-0

=1-(199/200)^5

=0.02475

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: Max, P=0.3(2000) is the most likely outcome of the business venture.

1. Is the venture likely to be successful? Explain

Ans: (P(x&gt;0)=0.6,implies there is a 60%chance that the venture would yield

profits or greater than expected returns .P is only 0.2 so the venture is likely to

be successful.

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

Ans: Weighted average= x\*P(x)=800 this means the average expected earnings

over a long period of the time would be 800

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

Ans: P(loss)=P(X=2000)+P(x=1000)0.2 so risk associated with this venture is 20%