**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.

Inter-quartile Range (IQR) = Q3 – Q1

= 12 – 5

= 7

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

Right 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?

There will be no outlier in the data



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

The mode of the dataset lie between 5 to 7

1. Comment on the skewness of the dataset.

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.

From the above Boxplot and histogram we can say that

The Median will be 7(approximately)

The skewness for both Boxplot and Histogram is Right Skewed

We will observe for both Boxplot and Histogram 25 as Outlier

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.)

Number of calls(n)= 5

P(X) = nCxpxqn-x

Probability of call misdirecting (P)= 1/200.

Probability of call not misdirected (q) = 1- 1/200 = 199/200.

Attempted telephone calls 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) | E(X)=X.P(X) | E(X2)=X2.P(X) |
| -2,000 | 0.1 | -200 | 400000 |
| -1,000 | 0.1 | -100 | 100000 |
| 0 | 0.2 | 0 | 0 |
| 1000 | 0.2 | 200 | 200000 |
| 2000 | 0.3 | 600 | 1200000 |
| 3000 | 0.1 | 300 | 900000 |
|  | Total | 800 | 2800000 |

1. What is the most likely monetary outcome of the business venture?

The outcome of the business venture is $2000 as it has probability maximum of 0.3.

1. Is the venture likely to be successful? Explain

Positive x values are successful,so that we have to take 1000,2000 and 3000.

Probability values are 0.2,0.3,0.1. so P= 0.2+0.3+0.1 = 0.6 > 0.5(p value).so it is successful.

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

The average of long-time earning of business ventures is E(X) = 800.

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

Risk of venture Var(X) = E(X2)-[E(X)]2

= 2800000-(800)2

= 2160000 (Quite high)

Std = sqrt(var) = sqrt(2160000)

Std = 1470$

When variate is high then risk is high.