**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 |  | 33.27133333333333 |
| Standard deviation |  | 16.945400921222028 |
| variance |  | 287.1466123809524 |



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:

Range from 5 to 12

Viscous 0 to 19

Outlier 1

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

ANS:

Left skewness

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:

It scale the chart



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

ANS: 6 to 8

1. Comment on the skewness of the dataset.

ANS:

Left skewness

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:

We can’t diff mode in box plot but we can do that in hist

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:

one in 200 long-distance telephone calls is misdirected

=> probability of call misdirecting  p = 1/200

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

Number of Calls = 5

n = 5

p = 1/200

q = 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:

The most likely monetary outcome of the business venture: 𝑥= $2,000with the highest probability of 0.3

1. Is the venture likely to be successful? Explain

ANS:

Venture is successful if X is +ve

Hence

if x is 1000, 2000, 3000

Probability is

= 0.2+0.3+0.1

=0.6

0.6 > 0.5

hence likely to be successful

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

ANS:

Long-term average earning of business ventures = E(x)

E(X) = ∑X.P(X)

= $800

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

ANS:

The good measure of the risk involved in a venture of this kind depends on the Variability in the distribution. Higher Variance means more chances of risk.

Var (X) = E(X^2) –(E(X))^2

= 2800000 – 800^2

= 2160000.