**Topics: Descriptive Statistics and Probability**

1. Look at the data given below. Plot the data, find the outliers and find out

Mean=33.27133

Variance=287.1466

SD=16.9454

|  |  |
| --- | --- |
| **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. IQR=Q3-Q1

13-5=8

Through interquartile range we get to know of the outlier we have is mild or strong.

1. What can we say about the skewness of this dataset? It is right skewed or 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? There would be no change since the boxplot ends before 19



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie? Between 5 and 10
2. Comment on the skewness of the dataset. It 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.
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.)

P(CALL MISDIRECTING)=1/200

P(CALL NOT MISDIRECTING)=199/200

NO OF CALLS=5

ATLEAST ONE IN FIVE ATTEMPTED TELEPHONE CALLS REACHES WRONG NUMBER= 1-5c0(1/200)^0(199/200)^5

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 |

E(X) P(x) E(X)P(X)

-2,000 0.1 -200

-1,000 0.1 -100

0 0.2 0

1000 0.2 200

2000 0.3 600

3000 0.1 300

800

What is the most likely monetary outcome of the business venture? As the probability (0.3) is more for 2000 $ as compared to others,

Therefore, most likely monetary outcome of the business venture = 2000$

1. Is the venture likely to be successful? Explain

venture is likely to be successful as Expected value is = 800 $

* As the long-term average gives positive numbers the Business venture likely to be successful.

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

long-term average earning of business ventures = most likely monetary outcome of the business venture  is 2000  $

as it has maximum probability = 0.3

E(X)           P(x)      E(X)P(X)

-2,000   0.1            -200

-1,000     0.1            -100

0              0.2             0

1000         0.2           200

2000        0.3           600

3000         0.1           300

                                 800

Expected value =  ∑E(X)P(X)  = 800

long-term average earning of business ventures  = 800 $

venture is  likely to be successful as Expected value is + ve   = 800 $

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