**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% |

Answers) mean = 33.17

Variance = 0.02871

Standard deviation = 0.16945

The outliers are morgan stanley(91.36%) which is the highest outlier given in a data set.



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.
2. What can we say about the skewness of this dataset?
3. If it was found that the data point with the value 25 is actually 2.5, how would the new box-plot be affected?

Answer:

1. IQR = 7
2. From the data set we can say it is positively skewed.
3. If 25 is 2.5 is placed then the point lies between 0 to 5 , which means no outlier will be formed.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?
2. Comment on the skewness of the dataset.
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.

Answer:

1. In these data set the mode will lie at 5&6.
2. The skewness is positively skewed.
3. If the data set are same then the information of these data set will lie min value at 5,and meadian at 10, and max at 15 and outliers wil lie at 25.
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.)

Answer:

Probability of call misdirecting p =1/200

Probability of call not misdirecting q=1-1/200=199/200

Number of calls = 5

Then P(x) = ⁿCₓpˣqⁿ⁻ˣ

n=5, p=1/200,q=99/200

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

**probability that at least one in five attempted telephone calls reaches the wrong number = 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?
2. Is the venture likely to be successful? Explain
3. What is the long-term average earning of business ventures of this kind? Explain
4. What is the good measure of the risk involved in a venture of this kind? Compute this measure

Answer)

1. The monetary outcome will p(0.3) due to high monetary value.
2. Yes the venture will be successful because the p(0.1)and p(0.1) will be in loss and p(0.2)p(0.3)andp(0.1) will be gained . in these way venture can be successful.
3. Log term average will calculated as Exception . by these the long term earnings will be average =800.
4. It is involved good measure . well if we calculate from p(0.2)p(0.1)and p(0.1) the tha x of earnings will be decreasing the from p(0.2)p(0.2)&p(0.3)p(0.1) the earnings are increasing, from these it is involved in good measure.