**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 1 – Refer code in – Basic stats 2

Mean = 33.27

Std deviation = 16.37

Variance = 268.00

Outlier = Morgan Stanley - 91.36%



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 = 12 – 5 = 7 , it implies the spread of data

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

Data is positively skewed, as Median line is towards Q1

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?

Boxplot will not be affected much negligible shift towards right, the datapoint showing 25 will be removed



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

5

1. Comment on the skewness of the dataset.

Data is right skewed as it has long tail towards high value end

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.

Answer - Boxplot tells Median = approx. 7

Histograms tells Mode = approx. 6

Both plots confirm 15 is outl.ier

For right skewed data Mean > Median> Mode

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 – Probability of mis direction of call = 1/200 = 0.005

Probability of right direction = 1-0.005 = 0.995

Probability(of atleast one of five call are misdirected) = 1 – Probability(none of the 5call are mis directed)

= 1 – P(1st not misdirected)\*P(2nd not mis directed)\*…\*p(5th not mis directed)

= 1 – 0.995\*\*5

= 0.024

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. 2000 has maximum probability of outcome
2. Venture has more probability (=0.6) of positive return – hence venture likely to be successful
3. Long term average = -2000\*0.1 + -1000\*0.1+0\*0.2+ 1000\*0.2 +2000\*0.3 +3000\*0.1 = 800
4. P(loss) = 0.1 +0.1 = 0.2, 20% of risk is involved