**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(descriptive$Measure.X)

[1] 33.27133

> sd(descriptive$Measure.X)

[1] 16.9454

> var(descriptive$Measure.X)

[1] 287.1466



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 is 5 – 12 which means 50% of data lies between these 2 values
2. What can we say about the skewness of this dataset? Positively Skewed
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? There will not be any outliers



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie? 4-8
2. Comment on the skewness of the dataset. 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. Box plot & Histogram is for same dataset already. The dataset is not perfectly normally distributed
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.)

Call mis-directing = 1/200

Call not misdirecting = 1-1/200 = 199/200

N=5

P(0)

Probability of at least 1 call reaches wrong no. = 1 – no calls reaches wrong no.

= 1 – (5C0 x (1/200)^0 x (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?

= (-2000 x 0.1) + (-1000 x 0.1) + (0 x 0.2)+ (1000x 0.2) + (2000 x 0.3) + (3000 x 0.1 ) = -200 + -100+0+200+600+300 = 800 $

1. Is the venture likely to be successful? Explain

If the venture can maintain for long term business, then eventually it will be successful since the probability of non-negative return is higher than 0.50 and the expected value for return is a positive number ($800)

1. What is the long-term average earning of business ventures of this kind? Explain 800$
2. What is the good measure of the risk involved in a venture of this kind? Compute this measure probability of non-negative return is higher than 0.50