**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% |

Data has been plotted as box plot below

=33.271333

= 16.945401

= 287.14661

Graphical user interface, text, application

Description automatically generated



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:-** IQR= Q3-Q1= 12-5=7

So IQR is 7.

IQR represents 50% of the data

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

**ANS:-** Dataset is right/positive skewed

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:-**  The new box plot will not be affected.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**ANS:-** The mode lies between 4 to 8. It is multi model

1. Comment on the skewness of the dataset.

**ANS:-** The skewness of the dataset is positive/right skewed

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:-** Boxplot helps to get the value of outliers which we cannot get from Histogram.

Histogram gives us the frequency of the datapoints

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:-** Lets us say that E = The call is misdirected

then probability of the event E is P(E)= 1/200

Probability that no attempted call reaches the wrong number P(E bar)=199/200

Probability that at least one in 5 attempted call reaches the wrong number:

= 1 – P(E bar)^5

= 1 - (199/200)^5

= 0.025

Probability that at least one in 5 attempted call reaches the wrong number = 0.025

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:- 2000

1. Is the venture likely to be successful? Explain

ANS:- Yes, there are 60% chances of getting a positive return and 20% chances of negative returns or debts.

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

ANS:- Long term returns = ((-2000\*1)+ (-1000\*1)+ (1000\*2)+ (2000\*3)+ (3000\*1) / 6) = 8000/6 = 1333

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

ANS:- Good measure is, Positive returns (profits) probability tends to be more than negative returns (loss). i.e. 60% probability of profits and 20% probability of loss.