**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 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.

The inter-quartile range of the given dataset is 7.

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

The dataset is positively 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?

The new box plot will probably not have any outlier.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

The mode of the given dataset will lie between 4 – 6 and 6-8.

1. Comment on the skewness of the dataset.

The dataset is positively 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.

In the case mentioned above, the box plot clearly gives the value of outlier which is not provided by histogram. On the other hand histogram clearly gives us the frequency of each data point which is not provided by the box plot.

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.)

Suppose A is the event that the call is misdirected.

Therefore probability of event A is

P(A)= 1/200

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

= 1 - Probability that no attempted call reaches the wrong number

= 1 – P (A bar)

{P ( A bar) = 1 – P(A) = 1 – (1/200) = 199/200}

= 1 – (199/200)\* (199/200)\* (199/200)\* (199/200)\* (199/200)

= 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?

The most likely monetary outcome of the business venture is 2000.

1. Is the venture likely to be successful? Explain

Yes the venture seems to be successful as by the data we can see that there is 60 % chance of getting positive returns.

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

Average earnings = (-2000 \*0.1)+(-1000 \* 0.1)+(0 \* 0.2)+(1000\*0.2)+(2000\*0.3)+(3000\*0.1) / 6 = 133.33

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

The good measure of risk involved in this type of venture is that there is 60% probability of profit while only 20 % probability of loss.