**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% |

Ans.: There is one outlier present in the dataset which is due Morgan Stanley.

Mean = 33.271

Std.dev = 16.945

Variance = 287.146



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: Inter quartile range is present between the range 5-10.5 and this implies that 50% of data is present between the range 5-10.5

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

Ans: 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?

Ans: Now the data point is present at value 25 it implies there is an outlier present in the lower extreme, if the data point gets shifted to 2.5 we will get the box plot without an outlier



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: The data set is unimodal. The mode of this data set lie between 4-10

1. Comment on the skewness of the dataset.

Ans: Our data 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.

Ans: In both boxplot and histogram we can see that data is positively skewed and has an outlier.

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: Here the total no of events will be 200

Probability that one call is misdirected is 1/200

Probability that none of the call is misdirected = 1 – Probability that one call is misdirected

i.e 1-(1/200)=199/200.

Now we have to calculate probability that atleast one in five attempted calls reaches the

wrong number

So, 1 – probability of none of the calls misdirected = 1-(199/200)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?

Ans.: Here as we have to find the most likely monetary income of the business venture so here we will find the expected probability, so expected probability will be x\*P(x) = -999.9

1. Is the venture likely to be successful? Explain

* Ans.: Since the probability of non-negative returns is more than 0.5 which is 50%, the venture will be successful if these rates are maintained. 0.2+0.3+0.1=0.6

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

* Ans.: p(x)\*x = (-2000\*0.1) +(-1000\*0.1) +(0\*0.2) +(1000\*0.2) +(2000\*0.3) +(3000\*0.1)

= -200-100+0+200+600+300

=800

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

Ans.: Standard Deviation