**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: Mean = 33.2713

Variance = 287.1466

Std.Deviation = 16.9454

Outliers = 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.

Ans: IQR =12-5= 7

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

Ans: Right Skewed data

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: We can say it as outlier, Outliers can affect the Mean, Median and Other percentiles.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: 4 - 8

1. Comment on the skewness of the dataset.

Ans: Right skewed data

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: Histograms are bar graph that shows a bar for a range of data values instead of a single value.

A boxplot is a data display that draws a box over a number line to show the interquartile range of the data.

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: :- Probability of call misdirecting (p) = 1/200

Probability of call not misdirecting (r) = 1-1/200=199/200

No. of calls = 5

P(p) = nCx.p^x.r^n-p

n = 5

Probabaility of atleast one in five attempted telephone calls reaches the wrong number

= 1 - None of the call reaches wrong number

= 1 - nCx.p^x.r^n-p = 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: Most likely monetary outcome of the business venture is $2000 because it has maximum probability i.e., 0.3

1. Is the venture likely to be successful? Explain

Ans: Venture is successful, because x is positive .

Therefore , x is $1000,$2000 and $3000.p(x) is 0.1+0.2 +0.3=0.6

0.6 >0.5, so venture is likely to be successfully.

(iii) What is the long-term average earning of business ventures of this kind? Explain

Ans: Long-term average earning of business ventures is E(x) = x.P(x)

E(x) = $800

(iv) What is the good measure of the risk involved in a venture of this kind? Compute this measure

Ans: Variability is quite high, So risk is high