**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: Inference: There is One Outlier: Morgan Stanley at 91.36%

|  |  |
| --- | --- |
| *Mean* | 33.27133333333333 |
| *Variance* | 287.1466123809524 |
| *Standard Deviation* | 16.945400921222028 |

1. Questions referred to from *Aczel A., Sounderpandian J., Complete Business Statistics (7ed.)*



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=5-12.This means maximum value of x is lies in between 5 to 12

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

Ans:The data is skewed right.

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: If it was found that the data point with the value 25 is actually 2.5,the out lairs will be at lower extreme side.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: Mode of the dataset lies between 4 -8

1. Comment on the skewness of the dataset.

Ans: Data is skewed rignt.

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: The data is skewed right .The outliers are present at upper extreme.

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:one in 200 long-distance telephone calls is misdirected

probability of call misdirecting p = 1/200

Probability of call not Misdirecting = 1 - 1/200 = 199/200

Number of Calls = 5

P(x) = ⁿCₓpˣqⁿ⁻ˣ

n = 5

p = 1/200

q = 199/200

at least one in five attempted telephone calls reaches the wrong number

= 1 - none of the call reaches the wrong number

= 1 - P(0)

= 1 - ⁵C₀(1/200)⁰(199/200)⁵⁻⁰

= 1 - (199/200)⁵

= 0.02475

probability that at least one in five attempted telephone calls reaches the wrong number = 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?

Ans: It can be seen from the above table that for x = 2000, the value of P(X) most. Hence, the most likely monetary outcome of the business venture is x = 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.