**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 :OUTLIERS:Morgan Stanley-91.36%**

**Mean :33.27**

**Standard Deviation:16.94**

**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:IQR=UPPER QUARTILE RANGE-LOWER QUARTILE RANGE

12-5=7

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

ANS:The given data set is Right Skeweed

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: This change in value will affect the mean in a way that it reduces , and the median also reduces



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

ANS: Mode is at 4 to 6 (OR) 6 TO 8 values of Y

1. Comment on the skewness of the dataset.

ANS:Right Skeweed dataset

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:We can Find

* From histogram we get Skewness

Histogram gives the frequency of the distribution of values of Y

* From Boxplot we get Outliers

Box plot provides the IQR ,Outliers and the Whiskers.

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: The total no long distance calls = 200

Probability of call being misdirected= 1/200

Sample calls = 5

Probability of at least one in five attempted calls reaches wrong number

=5\*(1/200) = 0.025 = 2.5%

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: The value of x with highest probability= 2000

1. Is the venture likely to be successful? Explain

ANS:P(x) to Fail=0.1+0.1=0.2

P(x) to Fail/success=0.2

P(x) to be successful= 1-(0.2+0.2) = 0.6=60%

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

ANS:Mean= [(-2000\*0.1)+(-1000\*0.1)+(0)+(1000\*0.2)+(

2000\*0.3)+( 3000\*0.1)]

Average Earnings=800

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

ANS: Risk involved in a venture

VAR= E(X2)-[E(X)]2

=[(-20002\*0.12)+(-10002\*0.12)+(0)+(10002\*0.22)+(

20002\*0.32)+( 30002\*0.12)]- [(-2000\*0.1)+(- 1000\*0.1)+(0)+(1000\*0.2\*2000\*0.3)+( 3000\*0.1)]2

= 2160000

Standard Deviation=√var=1470