**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 = 33.37

SD = 16.9454

Variance = 287.1466

Morgan Stanley = 91.36 is outlier.



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 = 3 approx. thr inter quartile range gives us a measurement how spread out the entirety of aur data set is.

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

Ans:- Right skewed, positive 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:- The mean value is range



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans:- The mode lies between 5 to 7

1. Comment on the skewness of the dataset.

Ans:- Positive 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:- Skewness of both the plot is same.

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 wrong number out of 200

Probability of wrong number:

P(WN)= 1/200= 0.005

Probability of not wrong number=

1-P(WN)=1-1/200 = 0.995

Probability of at least one out of five is a wrong number =

1-Probability that all five calls are not wrong numbers

1-(1-P(WN))^5

1-(1-0.005)^5 = 1-0.975= 0.024 = 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:- X= 2000 is highest probability of 0.3

1. Is the venture likely to be successful? Explain

Ans:- since probability of non negative return is more than 0.5 which is 50%. The venture will 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:- P(loss) = P(x= -2000)+p(x=-1000)= 0.2 so the risk associated with this venture is 20%