**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:-* [*Tap to View*](https://colab.research.google.com/drive/1GCsjAilp2ac-RmBln4oDiqG3qRXVF-Bb?usp=sharing)



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:- range= max-min

12-5=7

Min value is 5 and max value is 12, and there is a outlier on 25

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

*Ans- Right 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:- In that case outlier change the position to 2.5 from 25 and the data given the boxplot is right skewed, because of changing of outlier to 2.5 so their will be no outlier and right skewness will become normal distribution.*



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

*Ans- The mode of this dataset would lie in 4 to 8.*

1. Comment on the skewness of the dataset.

*Ans- Right 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- Ans: They both are right-skewed and both have outliers the median can be easily visualized in box plot where as in histogram mode is more visible.*

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 that at least one in 5 attempted call reaches the wrong number is****0.025***

*Let us define an event*

*E: The call is misdirected*

*then probability of the event E is*

*P(E) = 1/200*

*Therefore,*

*P(E)= 1-P(E)=1- 1/200 = 199/200*

*Probability that at least one in 5 attempted call reaches the wrong number*

*= 1 - Probability that no attempted call reaches the wrong number*

*= 1- (199/200 \* 199/200 \* 199/200 \*199/200 \* 199/200)*

*= 1-(199/200)5*

*= 7920399001/2005*

*= 0.025*

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 most likely monetary outcome of the business venture is 2000 because its possible outcomes is high*

1. Is the venture likely to be successful? Explain

*Ans:- Yes, because probability is increasing. this states that there is a good 80% chances for this venture to be making a profit*

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

*Ans:- (-2000\*0.1)+(-1000\*0.1)+(0\*0.2)+(1000\*0.2)+(2000\*0.3)+(3000\*0.1)=800*

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

*Ans: The good measure of the risk involved in a venture of this kind depends on the Variability in the distribution. Higher Variance means more chances of risk var(x)*