**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% |

Answers:

|  |  |
| --- | --- |
| **Mean** | 29.62% |
| **VARIENCE** | 0.0268 |
| **S.D** | 0.163708 |



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.

**Answer:** IQR = 7(approx.) the value implies that the difference between Q3 & Q1

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

**Answer:** this data is 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?

**Answers :** if the data point with the value 25 is actually 2.5 this would make no outliers (i.e)

The given box plot would be symenterical distribution (normal distribution)



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Answer:** 5 (values of y)

1. Comment on the skewness of the dataset.

**Answer:** the given data is right skewed (i.e) 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.

**Answers:** data distribution, outliers, visualization, summary stats

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.)

**Answer**: This problem can be solved by using binomial distribution .

Binomial distribution formula P(x)= ncx \* p^x \* q^n-x ((q=1-p)

Here n is number of attempts=5

P is probability of misdirected calls ( 1 in 200)=1/200

P(x >1) = 1-p(x=0)

P(x=0) = 1\*1\*(1/200)^0 \* (1- 1/200)^(5-0)

= 0.9744

P(x >1) = 1 – 0.9744

=0.0256

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?

**Answer:** $2000

1. Is the venture likely to be successful? Explain

**Answers:** yes the venture is likely to be successful because when the expected value is calculated we have seen profit of $800 here the profit is averaged

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

**Answers:** the long term average earning of business ventures is $800 as we calculated the expected profit for ventures

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

**Answers:** to calculate the good measure of the risk involved in a venture then we need to find the standard deviation of the given data . 