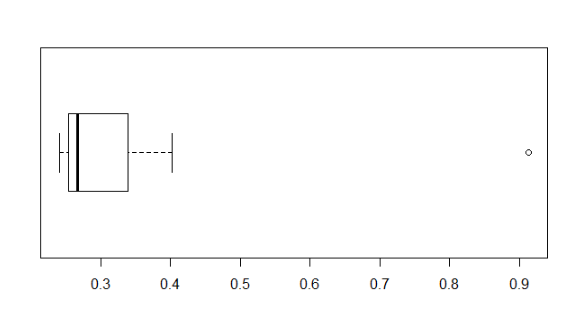
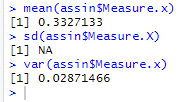
**Topics: Descriptive Statistics and Probability**

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% |







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.
2. What can we say about the skewness of this dataset?
3. 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.**

1. **IQR = Q3 – Q1 = 12 – 5 = 7**
2. **Since the data distribution is concentrated on the left so it is positively skewed.**
3. **New box plot would have shifted towards right. The outlier in the box plot will be removed**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?
2. Comment on the skewness of the dataset.
3. 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.**

1. **Mode is the value that occurs with greatest frequency. Here from 4 to 8 values of Y which shows the highest frequency.**
2. **Since the mass of the data distribution on the left side, it is positively skewed.**
3. **Both the graphs are positively skewed , both had same median.**
4. 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.)

**consider the probability of 1 call misdirected out of 200 as event A.**

**Probability of occurring of event A= 1/200**

**P(A)= 1/200**

**Probability of having at least one successful call will be**

**1-P(A)= 1-1/200= 199/200= 0.967**

**As every event is independent of other event the probability will be**

**1- (0.967)^5**

**0.02475 = 2% chance.**

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?
2. Is the venture likely to be successful? Explain
3. What is the long-term average earning of business ventures of this kind? Explain
4. What is the good measure of the risk involved in a venture of this kind? Compute this measure

**Ans.**

1. **2000**
2. **Since the probability of getting returns in negative and 0 are 0.4 which high and probability of getting returns more than 1000 is also 0.4 so it can be be successful.**
3. **(-2000\*0.1)+(-1000\*0.1)+(0\*0.2)+(1000\*0.2)+(2000 \*0.3)+(3000\*0.1)=800**
4. **Risk is you can get negative as well as 0 returns** **Risk stems from the possible variability in the expected returns. Therefore a good measure to evaluate the risk for a venture of this kind would be variance or standard deviation of the variable X.**

**> sd(ex$x)**

**[1] 1870.829.**

**> var(ex$x)**

**[1] 3500000**

**The large value of standard deviation of $1870 is considered along with the average returns of $800 indicates that this venture is highly risky.**