**Topics: Descriptive Statistics and Probability**

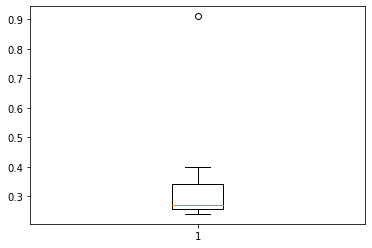
1. Look at the data given below. Plot the data, find the outliers and find out

|  |  |
| --- | --- |
| **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% |

Mean= **0.332**

SD= **0.168**

Var= **0.028**



Morgan Stanley is an 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.-- **5 to 12.5 .It implies that 50% of data lies between this range**
2. What can we say about the skewness of this dataset? **Data is somewhat rightly skewed**
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? **Then there will be no outliers in dataset**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie? **Mode of this dataset lies between approximately between 4 to 8**
2. Comment on the skewness of the dataset,.--- **data is rightly skewed**
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. --- **histogram will give information about mode but from boxplot can’t define mode value**
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.)

**one in 200 long-distance telephone calls is misdirected**

**=>  probability of call misdirecting  p = 1/200**

**Probability of call not Misdirecting = 1 - 1/200 = 199/200**

**Number of Calls = 5**

**P(x) = ⁿCₓpˣqⁿ⁻ˣ**

**n = 5**

**p = 1/200**

**q = 199/200**

**at least one in five attempted telephone calls reaches the wrong number**

**= 1  -  none of the call reaches the wrong number**

**= 1  - P(0)**

**= 1   -  ⁵C₀(1/200)⁰(199/200)⁵⁻⁰**

**= 1  -  (199/200)⁵**

**= 0.02475**

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?—2000$
2. Is the venture likely to be successful? Explain—yes **p(1000)+p(2000)+p(3000)= 0.2+0.3+0.1= 0.6**
3. What is the long-term average earning of business ventures of this kind? Explain

**0.1\*(-2000)+0.1\*(-1000)+0.2\*0+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

**~~ 0.1\*(-2000)+0.1\*(-1000)= -200**