**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 | 33.27% |
| std deviation | 0.169454009 |
| variance | 0.028714661 |

* **The outlier is the Morgan Stanley**



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.**

* IQR is the difference between Third Quartile and First Quartile.

IQR = 12-5 = 7

Whiskers are 0 to 19 and 1 outlier

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

* The middle in the box are shows the date positively 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?**

* Its scale the chart



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

* The mode of the dataset is lie between 4 to 8

1. Comment on the skewness of the dataset.

* The data set is 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.

* We can’t be define the mode in box plot but we an do this in histogram

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.)

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

**probability that at least one in five attempted telephone calls reaches the wrong number = 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?

The most likely monetary outcome of the business venture: 𝑥 = 2,000 with the highest probability of 0.3

1. Is the venture likely to be successful? Explain

The venture is likely to be successful =P( x) (1000+2000+3000)= 0.2+0.3+0.1 = 0.6

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

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

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

Std = 0.081649658