**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% |



* The Outlier in the Box plot - Morgan Stanley which is 91.36%
* Mean=33.27134
* Standard Deviatiom=16.9454
* Variance=287.1466

2)

Answer the following three questions based on the box-plot above.



* What is inter-quartile range of this dataset? (please approximate the numbers) In one line, explain what this value implies.

Ans: IQR range

= Q3-Q1

=12-5

=7

The IQR and the Median are approximatly same i.e . 7

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

Ans: Right Skewed distribution of dataset

* 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: Then there is no outlier on the given dataset, because the point 2.5 lies in the left miniscus of the boxplot.It will also reduce the datasize and it will follow normal distribution

3)



Answer the following three questions based on the histogram above.

* Where would the mode of this dataset lie?

Ans: The mode lies between point 5 to 10.

* Comment on the skewness of the dataset.

Ans: Right Skewed

* 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: The both graphs are Right- Skewed and both graphs show Outliers. In Box-plot Median is visible and in Histogram Mode is more Visble.

* 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 of call getting misdirected = **1/200**

Hence the probability of call not getting misdirect = 1 - (1/200) = 199/200

Number of phone calls attempted = 5

=1-(199/200)^5

=0.025

* 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 |

* What is the most likely monetary outcome of the business venture?

Ans: Here 2000 has the highest probability i.e. 30%

* Is the venture likely to be successful? Explain

Ans: Yes, Because the total earning of the venture is positive i.e. 800 and highest probability of eraning is 2000

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

Ans: for income we need to multily the x variable with the probability

hence the total income will be = (-200)+(-100)+0+200+600+300=800

The Long term eraning of venture is 800

* 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

Variablility in the distribution. Higher the Variance means more chance of Risk.

Var(x) =E(X^2)-(E(X))^2

=2800000 - 640000

=2160000