**Topics: Descriptive Statistics and Probability**

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

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

Ans) Mean= 33.27, Standard Deviation: 16.94, Variance= 287.14

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| --- | --- |
|  |  |



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. inter-quartile range of this dataset is 5 to 12.5,

IQR=Upper quartile – Lower Quartile, it is the median 50% of the data

1. What can we say about the skewness of this dataset?
2. 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?
4. We would not have the Outlier



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

a) At 6

1. Comment on the skewness of the dataset.

a)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.

a)

* It is right skewed data and we have one outlier
* Values between 4 to 8 have more frequency
* -Maximum values are between 4 to 12

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.)
2. IF 1 in 200 long-distance telephone calls are getting misdirected.

probability of call misdirecting = 1/200

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

P(x) = at least one in five attempted telephone calls reaches the wrong number P(x) = ⁿCₓ pˣ qⁿ⁻ˣ P(x) = (nCx) (p^x) (q^n-x) # nCr = n! / r! \* (n - r)! P(1) = (5C1) (1/200)^1 (199/200)^5-1 P(1) = 0.0245037

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 as the probability is 0.3

1. Is the venture likely to be successful? Explain

* Yes, the probability that the venture will make more than 0
* 0.1+0.1+0.2+0.3+0.1=0.8

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

- The long-term average is Expected value = Sum (X \* P(X)) = 800 which means on an average the returns will be 800

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

- The good measure of the risk involved in a venture of this kind depends on the Variability in the distribution. Higher Variance means more chances of risk Var (X) = E(X^2) –(E(X))^2 =1870