**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% |

**ANS.**

The outlier is 91.36%.

|  |
| --- |
| Min. 1st Qu. Median Mean 3rd Qu. Max.  0.2414 0.2547 0.2671 0.3327 0.3397 0.9136  > sd(y)  [1] 0.169454  > var(y)  [1] 0.02871466  > mean(y)  [1] 0.3327133 |
|  |
|  |
| |  | | --- | |  | |



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.

**Ans. The IQR is 5-12(apprx.) 50% of data is present in this range.**

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

**ANS. The data set is 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?

**ANS. IT affect the IQR of the box plot and could be equally distributed by the median.**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**ANS. Mode lies from 4-8 value of y.**

1. Comment on the skewness of the dataset.

**ANS. Right or positive 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.

**ANS**

* Median of the dataset is 7
* Mode lies between 4 -8
* Right skewed so mean > median
* 50% of the data lies between 5 to 12
* Has an outlier with value 25
* It is positively skewed

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.)

**ANS.** One wrong number out of 200

Probability of wrong number:

P(WN) = 1/200 = 0.005

Probability of at least one out of five is a wrong number

= 1 – Probability that all five calls are not wrong numbers

= 1 – (1 – P(WN))^5

= 1 – (1- 0.005)^5

= 1 – 0.975

= 0.024

= 2.5%

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?

**ANS. The most likely outcome of this business venture is a return of $2000 as it has the highest probability of occurrence.**

1. Is the venture likely to be successful? Explain

**Ans. yes because the probability occurrence of positive i.e ($1000 x o.2 +$2000 x 0.3 + $3000 x 0.1) > then ($-2000 x 0.1 +$-1000 x 0.1)**

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

**ANS. (-2000 x 0.1) + (-1000 x 0.1) + 0 x 0.2 + 1000 x 0.2 +2000 x 0.3 + 3000 x 0.1 = 800 is the long term average earning.**

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

**Ans. The good measure of risk involve in a venture of this kind .**