# 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% |



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: Inter quartile range is 5 to 12, inter quartile range is a measure of dispersion, which means spread of the data

1. What can we say about the skewness of this dataset?  
   Ans: Positively skewed
2. 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: If the data point with the value 25 is actually 2.5, there will be no outliers for the data and there will be change in median value



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: The data is bimodal 4 and 8

1. Comment on the skewness of the dataset.

Ans: positively 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: Skewness of both are same

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** : Probability of calls misdirect = 1/200

Probability of calls do not misdirect = 1-1/200 =199/200

Probability of at least one in five attempted telephones reaches wrong number = nCx pxqn-x

=5C1p(1/200)q(199/2000

= .0245

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: Most likely monetary outcome is 2000

1. Is the venture likely to be successful? Explain

Ans: E(X) = Σx.P(X) = 800, Since mean of the data is positive ,the venture is likely to be successful long term average earning

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

Ans : Long term average earning = 800

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

Ans: we can take variance as the good measure of risk

Variance = E(x2) – (E(x))2

E (x) = 800

E(x2) = x2.P(x)

= (-2000)2 x 0.1+(-1000)2 x 0.1+ 0 x 0.2+10002 x

0.2 + 20002 x .3+30002 x 0.1

= 2160000

Variance = 2160000