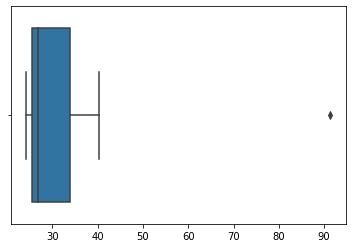
**Topics: Descriptive Statistics and Probability**

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 = 33.271

Variance = 268.003

Std = 16.370

Outliers = Morgan Stanley :- 91.36%



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

Ans. (i.) Inter- quartile range is the range between lower and upper quartile range which range from 5 to 13. It contains 50% of the data.

(ii) As the data on the right side from the mean contains more than the data on the left so. We can say that it is right skewed or positively skewed.

(iii) If the data point is 2.5 there would be no outliers as indicated as a dot or a point in the boxplot.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?
2. Comment on the skewness of the dataset.
3. 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. (i) The mode lies between 4 and 8 to be more precise we can say at 6.

(ii) The skewness is said to be right skewed as mean> median.

(iii) As from both boxplot and histogram we can say that the dataset is right skewed and contains outliers and more analysis is required.

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 one in 200 long-distance telephone calls is misdirected = 1/200

Probability of calls that is not misdirected = 1 – 1/200 = 199/200

By using the formula p = ⁿCₓpˣqⁿ⁻ˣ

P = 1/200

q = 199/200

n = 5

prob P = 1 – p(x)

1 – 5C0 (1/200)0  (199/200) 5 – 0  = 1 – (199/200)5 = 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?
2. Is the venture likely to be successful? Explain
3. What is the long-term average earning of business ventures of this kind? Explain
4. What is the good measure of the risk involved in a venture of this kind? Compute this measure

Ans. (i) The most likely monetary outcome of the business venture is 2000 as it has max probability 0.3

(ii) X.p(x) = (- 2000 \*0.1) +(-1000\*0.1) +(0) +(1000\*0.2) +(2000\*0.3)+(3000\*0.1) = 800. As the outcome is positive we can say the venture is successful

(iii) (- 2000 \*0.1) +(-1000\*0.1) +(0) +(1000\*0.2) +(2000\*0.3) +(3000\*0.1) = 800. Is the long-term avg earnings.