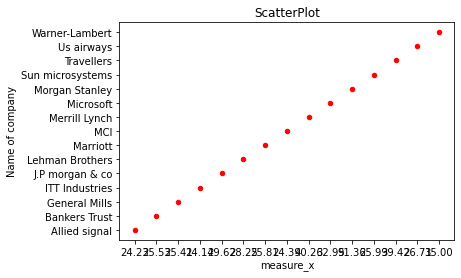
**Topics: Descriptive Statistics and Probability**

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 : There are no outliers detected by the scatter plot.

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2.



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) IQR = Q3-Q1 = 12-5 = 7.

It implies that the values of the variable x are present in the centre of the data set.

(ii) It is posively skewed since the median is tilted towards the left side.

(iii) The data point would rely on the left side of the boxplot as it is less than the Q1.



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 of the data set would lie somewhere between 5 to 7.

(ii)The above histogram is slightly positively skewed.

(iii)The histogram shows an appropriate distribution of the numerical data,Whereas a boxplot shows the spread , range and skewness of the data set on an average not accurate.

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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.)

The Formula for this type of binomial distribution data is =

P(x) = nCxpxqn-x

N = 5

p = 1/200

q = 199/200

Atleast one in five == 1

=1 – p(0)

=1- 5C0(1/200)0(199/200)5-0

= 1 – (199/200)5

=0.0247.

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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) As the probability of 2000 is high it is the most likely monetary outcome of the business venture.

(ii)The Expected value of this venture is the sum of E(x).P(x) of all columns = 800. The average expected value is positive hence yes, it is likely to be successful.

(iii) The sum of value of x (where x >0) = 0.2+0.3+0.1 = 0.6

0.6 implies there is 60% chance of profits in the future and the rest 40 % chance of loss.

(iv)Measure of risk = where the value of x is negative P = 0.1+0.1 = 0.2.

So probability of risk measure is 20%..