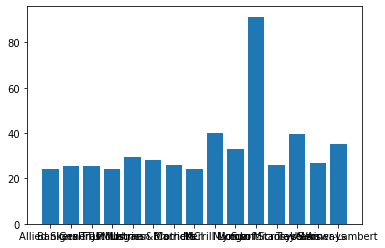
**Topics: Descriptive Statistics and Probability**

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 : Mean = 33.27**

**Variance = 287.14**

**SD= 16.94**

**Outliers = 91.36**



Answer the following three questions based on the box-plot above.

1. What is inter-quartile range of this dateset? (please approximate the numbers) In one line, explain what this value implies.

**Ans : 1) Upper IQR = 1.5 + (12-5)=8.5**

1. **Lower IQR = 1.5 - (12-5) = 6.5**
2. What can we say about the Skewness of this dateset?

**Ans : It is the positive Skewness because of the data is present on the right side .**

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 : There will be no outlier .**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dateset lie?

**Ans : 4 to 8**

1. Comment on the Skewness of the dateset.

**Ans : The data is present in the left side , so it is a positive Skewness**

1. Suppose that the above histogram and the box-plot in question 2 are plotted for the same dateset. Explain how these graphs complement each other in providing information about any dateset.

**Ans : Histogram is used to find out mode , Skewness , Kurtosis and boxplot is used to find out IQR and outliers .**

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.)

**Solution : The probability that one call reaches the wrong number is 1/200. The probability that all five calls reach the correct number is therefore (1 - 1/200)^5.**

**The probability that at least one call reaches the wrong number is therefore 1 - (1 - 1/200)^5. This is approximately equal to **0.02475**.**

**Therefore, the probability that at least one in five attempted telephone calls reaches the wrong number is **approximately 0.02475**.**

**Python**

import numpy as np

p = 1/200

q = 1 - (1 - p)\*\*5

print(q)

**Output:**

0.02475124687812502

**5** .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 monetary outcome of the business venture is 0.3 .**

1. Is the venture likely to be successful? Explain

**Ans : Yes the venture likely to be successful**

**P(x=1000)+P(x=2000)+P(x=3000)=0.2+0.3+0.1=0.6**

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

**Ans : (0.1)(-2000)+(0.1)(-1000)+(0.2)(0)+(0.2)(1000)+(0.3)(2000)+(0.1)(3000)=800**

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

**Ans : The good measure of the risk involved in a venture of this kind is standard deviation**