**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 = 33.27 , s.d = 16. 94 , variance = 287 . 14



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 : 5-12 data is not normally distributed ,high variability ,outliars are there

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

Ans : posetively skewed or skewed on 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 is no outliar present in upper range . point add up in inter quartile range which affects distribution in lower quartile and distribution also .



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: on left side of the distribution as data is rightly skewed

1. Comment on the skewness of the dataset.

Ans : Data is positively skewed or right 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: Data is not normaly distributed ,positively skewed, outliar in UQR , spread of the data is large in range .

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: given : 1 in 200 calls are misdirected

To find : probability that at least one in five attempted telephone calls reaches the wrong number

Solution : p (one in five attempted telephone calls reaches the wrong number )

= No .of calls mis direct in 5 calls/ Total no of calls

total no. of calls = 200

P (No .of calls mis direct in 5 calls) = 5! / 1!(5-1 ) !

= 5\*4\*3\*2\*1/ 1\*4\*3\*2\*1\*

= 5

Therefore P = 5/ 200 = 0.025

**probability that at least one in five attempted telephone calls reaches the wrong number is 0.025**

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 : $ 2000 p = 0.3

1. Is the venture likely to be successful? Explain

yes as positive venture is large as compare to negative one 0.2+0.2+0.3+0.1= 0.8 means 80% venture is positive , so overall business is in profit.

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

Ans: The long-term average is Expected value = Sum (X \* P(X)) = 800$ which means on an average the returns will be + 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 depends on the Variability in the distribution. Higher Variance means more chances of risk Var (X) = E(X^2) –(E(X))^2 = 2800000 – 800^2 = 2160000