**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. The outlier for this data is Morgan Stanley as it has the highest frequency.**

**Mean = 33% or 0.332**

**Standard Deviation = 16% pr 0.168**

**Variance = 2% or 0.028**



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. The inter-quartile range is between 5-12, it implies that most of the values in the dataset are concentrated in this area.**

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

**Ans. The dataset is Positively Skewed.**

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. The new box-plot won’t have an outlier.**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans. The data set could be said as Bi-modal since the mode is between 4-8.**

1. Comment on the skewness of the dataset.

**Ans. The dataset is 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. We can find the mode easily using the histogram which is cannot be found using boxplot.**

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 that once in 200 long distance telephone calls is misdirected.so,**

**P(calls misdirected)=1/200**

**P(calls not misdirected)=199/200**

**At least one in five attempted telephone calls reaches the wrong number**

**=1-none of the call reaches the wrong number**

**=1-P(0)**

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

**=1-(199/200)^5**

**=0.02475**

**The probability is 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?

**Ans. Most likely monetary outcome of the business venture is $3000 as it has he highest probability**

1. Is the venture likely to be successful? Explain

**Ans. Venture is likely to be successful as if we add the probability of positive returns it is higher than the negative or null returns i.e P(1000)+P(2000)+P(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. Long term average earning of the business is $800**

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

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

**Ans. The measure of risk involved is 8% or 0.081.**