**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% |

**A:** **After plotting the data we find that it had only 2 outliers.**

**= 0.32376**

**0.02873**

**0.16952**



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.

**A: Inter Quartile Range =Q3-Q1**

**=12-5**

**=7**

**Median = 7**

**Therefore, Inter Quartile Range is equal to Median.**

**The inter Quartile Range is difference between the 75th percentile and 25th**

**Percentile**

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

**A: It is positively skewed and it is not follows normal distribution.**

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?

**A: There are no outliers in the data set.**

**The boxplot is completely changes .The IQR and mean changes**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**A: Mode =21**

**Data set is lies between 4 and 8**

1. Comment on the skewness of the dataset.

**A: The data set is follows the normal distribution**

**The data set 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.

**A: The above boxplot is IQR of the data set and the histogram gives the range of data**

**Values .The boxplot is clearly show the 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.)

**A: The probability of the event E is P(E)=1/200**

**Therefore, P (E) =1-P (E) =1-(1/200)**

**=199/200**

**Probability that at least one is 5 attempted call reaches the wrong number is**

**=1-probability that no attempted call reaches the wrong number**

**=1-(199/200)5 =0.025**

**Therefore, Probability that at least one in 5 attempted call 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?

**A: Therefore, Most likely monetary outcome of the business venture = 2000**

**As it has the maximum probability is 0.3.**

1. Is the venture likely to be successful? Explain

**A: Venture is successful if X is positive**

**Hence if X is 1000, 2000 and 3000**

**Probability is (0.2+0.3+0.1) =0.6**

**0.6>0.5, hence venture likely to be successful.**

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

**A: Long term average earning of business ventures = E(X)**

**E(X) = ∑X P(X) = 800.**

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

**A: Risk involved in a venture is Var(X) = E(X2)-{E(X)}2**

**=2800000-(800)2**

**=2160000**

**SD= √Var = 1870**

**As variability is high hence Risk is high.**

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