**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% |
| JPMorgan & 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% |

THE DATA HAS OUTLIER 90

MEAN = μ = 33.26533333333333

STANDAR DEVIATION = σ = 16.948178944175964

VARIANCE= σ^2 = 287.2407695238095



**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.**

* THE IQR IS FROM 5 TO APPROXIMATELY 12.

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

* POSITIVE SKEWNESS

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?**

* THERE WOULD BE NO OUTLIERS



**Answer the following three questions based on the histogram above.**

1. **Where would the mode of this dataset lie?**

* 20 IS THE MODE

1. **Comment on the skewness of the dataset.**

* POSITIVE SKEWNESS.

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.**

* BOTH THE GRAPH HAS OUTLIER 25. THE HISTOGRAM SHOWS THE MODE 20. THE BOXPLOT SHOWS THE MEDIAN AS APPROXIMATELY 6. VALUES FROM 0 TO 25.

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.)**

* SAMPLE SIZE = N = 200

GIVEN :

Suppose that one in 200 long-distance telephone calls is misdirected=1/200

TO FIND :P( 1/5)=?

SOLN : THE PROBABILITY OF ONE IN 200 LONG-DISTANCE TELEPHONE CALLS IS MISDIRECTED IS

P(1/200)= 1-1/200

= 199/200

The Probability That At Least One In Five Attempted Telephone Calls Reaches The Wrong Number i.e PROBABILITY OF 5 RANDOMLY SELECTED FROM DIRECTED CALLS GET 1 MISDIRECTED = 1-[(199/200)\* (199/200)\* (199/200)\* (199/200)\* (199/200)\*

= 1-0.975248753121875

= 0.024751246878125

**Probability That At Least One In Five Attempted Telephone Calls Reaches The Wrong Number = 0.024751246878125**

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?**

* THE MOST LIKELY MONETARY OUTCOME OF THE BUSINESS VENTURE IS 0.3 THAT IS $2000.

1. **Is the venture likely to be successful? Explain**

* SUM OF ALL P(X)

0.1 +0.1+0.2+0.3 +0.1 =0.8

YES, THE VENTURE LIKELY TO BE SUCCESSFUL WITH 0.8%

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

* LONG TERM AVERAGE EARNING = EXPECTED VALUE = SUM OF ALL (X\*P(X))
* SUM(X\*P(X))= ( -2,000\* 0.1 )+(-1,000 \*0.1)+( 0 \*0.2 )+(1000\* 0.2 )+(2000 \*0.3)+( 3000\* 0.1)

=800

THE LONG-TERM AVERAGE EARNING OF BUSINESS VENTURES IS $800

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

* Higher Variance means more chances of risk Var (X)=E(X2)+E(X)2

E(X)2= EXPECTED VALUE = SUM OF ALL (X\*P(X))=8002=640000

E(X2)=SUM OF X2 \*P(X)=(-20002\*0.1)+(-10002\*0.1)+(10002\*0.2)+(20002\*0.3)+(30002\*0.1)

=2800000

VAR(X)=2800000+640000=3500000

Std=root[VAR(X)] =1870

GOOD MEASURE OF THE RISK INVOLVED IN A VENTURE OF THIS KIND IS $ 1870