**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% |



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; Apporoximately (first quartile range) Q1=5

( Third quartile range ) Q3=12 ,(Second quartile range)=7

Inter-Quartile Range( IQR)=Q3-Q1=12-5

=7

second quartile range is the median value and 1 outlier.

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

ANS ; right-skewed median is towards to left side .(left skewed)

it is not 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?

ANS; there would be no outliers on the given dataset bcz of the outlier the data had positively skewness.

It will be normal distribution.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

ANS; The mode of the dataset lie between 5 to 10 and approximately between 4 to 8 .

1. Comment on the skewness of the dataset.

ANS ; left 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.

ANS :They both are right skewed and both have outliers that median can be easily visualized in box-plot where the histogram mode is more visible.

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 : If 1 in 200 long distance telephone cells are getting misdirect.

Probability of call misdirecting =1/200

probabilityof call not misdirecting = 1-1/200=199/200

The probabilityfor atleast 1 in 5 attempt telephone calls reaches the wrong number.

Numbers of cells = 5

n=5

p=1/200

q=199/200

p(x)= at least 1 in 5 attempted telephone cells reaches the wrong numbers

p(X)=(nCx)( p^x )(q^n-x)

P(1) =( 5C1).(1/200)^1.(199/200)^5-1

=0.0245 (ans)

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 |

ANS : E(X) =Sum X.\*P(X) | E(X^2) =X^2\*P(X)

-200             | 400000

-100                 | 100000

0             | 0

200       | 200000

600         | 1200000

300         | 900000

Total: 800         | 2800000

(i) What is the most likely monetary outcome of the business venture?

Ans ; The mostly likely monetary outcomes of the bussiness ventures is 2000$

(ii) Is the venture likely to be successful? Explain

ANS ;yes,the probability that the venture will be make more than 0 or a profit .

p(x>0)+p(x>1000)+p(x>2000)+p(x>3000)=0.2+0.2+0.3+0.1

=0.8

thas states that there is a good 80% chances for the venture making a points .

(iii) What is the long-term average earning of business ventures of this kind? Explain

Ans ;The long- term average is expected value = sum (x \*p(x))=800$

which means on an average that return will be +800$

(iv) 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 .

var(x) = E(x^2)-(E(x))^2

=2800000-800^2

= 2800000-640000

=2160000 (ans).