**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% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of company** | **Measure X** | **Measure x** | **(x-mu)** | **(x-mu)^2** |
| Allied signal | 24.23 % | 0.2423 | 0.0904 | 0.008172 |
| Bankers Trust | 25.53% | 0.2553 | 0.0774 | 0.00599 |
| General mills | 25.41% | 0.2541 | 0.0786 | 0.00617796 |
| IT industries | 24.14% | 0.2414 | 0.0913 | 0.00833 |
| J.P morgan & co. | 29.62% | 0.2962 | 0.0365 | 0.00133 |
| Lehman brothers | 28.25% | 0.2825 | 0.0502 | 0.00252 |
| Marriott | 25.81% | 0.2581 | 0.00746 | 0.00005 |
| MCL | 24.39% | 0.2439 | 0.0888 | 0.00788 |
| Merrill Lynch | 40.26% | 0.4026 | -0.0699 | 0.00488 |
| Microsoft | 32.95% | 0.3295 | 0.0032 | 0.00001 |
| Morgan Stanley | 91.36% | 0.9136 | -0.5809 | 0.33744 |
| Sun microsystem | 25.99% | 0.2599 | 0.0728 | 0.006 |
| Travelers | 39.42% | 0.3942 | -0.0615 | 0.00518 |
| US airways | 26.71% | 0.2671 | 0.0656 | 0.00430 |
| Warner - lambert | 35% | 0.35 | -0.0173 | 0.00029 |
|  |  |  |  |  |
|  | Mu=0.3327 |  | (x-mu)^2 | 0.40200 |

Mu = 0.3327

Variance = 0.0287

Std = 0.169



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.

inter-quartile range is 12.5-5=7.5

The middle 50% data lies between 5 and 12.5

(ii) What can we say about the skewness of this dataset?

Ans: The data is right 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: 1) The median move slightly toward the left

2) The Q3 will move toward the left

3) The boxplot will no longer have outliers



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Ans: Mode is lies between 4 to 8

ii) Comment on the skewness of the dataset.

Ans: The data set is right skewed more concentrated toward the left no longer

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:

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.)

Probability of call misdirecting p =1/200

Probability of call not misdirecting=1-1/200=199/200

Number of calls =5

P(x)=nCxp^xq^n-x

N=5

= 1-P (0)

=1-5C0(1/200) ^0(100/200) ^5-0

=1-(199-200) ^5

=0.02475

=2.4%

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?

X=2000 with highest probability of 0.3

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

Ans: Probability of non-negative return is more than o.5 which is 50% the venture will be

Successful.

0.2+0.3+0.1=0.6

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

P(x)\*x=(-2000\*o.1) +(-1000\*0.1) +(0\*0.2) +(1000\*0.2) +(2000\*0.3)+(3000\*0.1)

Ans: =800

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

measure

Ans : Standard deviation