**Topics: Descriptive Statistics and Probability**

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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: IQR = 12-5 = 7 , This represent the range which contains 50% of the data points.

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

Ans: 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: Boxplot will start from 0 and end at 20 in representation, so 2.5 will not affect.



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

Between 4 and 8

1. Comment on the skewness of the dataset.

Right 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.

From histogram we get less inference, that only we can say that 25 is outlier

But in boxplot, including outliers we can also find out the range of data pointa.

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

n = 5

p = 1/200

q = 199/200

At least one in fve atempted telephone calls reaches the wrong number

= 1 - P(0)

= 1 - ⁵C₀(1/200)⁰(199/200)⁵⁻⁰

= 1 - (199/200)⁵

= 0.02475

The probability that at least one in five attempted telephone calls reaches the wrong number= 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?

Max probability is 0.3 for x= 2000. So most likely outcome is 2000.

1. Is the venture likely to be successful? Explain

P(x>0) = 0.6, implies there is a 60% chance that the venture would yield profits or greater than expected returns. P(Incurring losses) is only 0.2.So the venture is likely to be successful.

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

Weighted average = x\*P(x) = 800. This means the average expected earnings over a longperiod of time would be 800(including all losses and gains over the period of time)

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

P(loss) = P(x= -2000)+P(x=-1000)=0.2. So the risk associated with this venture is 20%