Q1) Identify the Data type for the Following:

|  |  |
| --- | --- |
| Activity | Data Type |
| Number of beatings from Wife | Discrete data |
| Results of rolling a dice | Discrete data |
| Weight of a person | Continuous data |
| Weight of Gold | Continuous data |
| Distance between two places | Continuous data |
| Length of a leaf | Continuous data |
| Dog's weight | Continuous data |
| Blue Color | Categorical data |
| Number of kids | Discrete data |
| Number of tickets in Indian railways | Discrete data |
| Number of times married | Discrete data |
| Gender (Male or Female) | Categorical data |

Q2) Identify the Data types, which were among the following

Nominal, Ordinal, Interval, Ratio.

|  |  |
| --- | --- |
| Data | Data Type |
| Gender | Nominal |
| High School Class Ranking | Ordinal |
| Celsius Temperature | Interval |
| Weight | Ratio |
| Hair Color | Nominal |
| Socioeconomic Status | Ordinal |
| Fahrenheit Temperature | Interval |
| Height | Ratio |
| Type of living accommodation | Nominal |
| Level of Agreement | Ordinal |
| IQ(Intelligence Scale) | Ratio |
| Sales Figures | Ratio |
| Blood Group | Nominal |
| Time Of Day | Interval |
| Time on a Clock with Hands | Ratio |
| Number of Children | Ratio |
| Religious Preference | Nominal |
| Barometer Pressure | Ratio |
| SAT Scores | Interval |
| Years of Education | Ordinal |

Q3) Three Coins are tossed, find the probability that two heads and one tail are obtained?

1. P(two heads and one tail) =N(Event (two heads and one tail)) / N(Event(three coins tossed))

=3/8

=0.375

=37.5%

Q4) Two Dice are rolled, find the probability that sum is

1. Equal to b) Less than or equal to 4 c)Divisible by 2 & 3
2. Number of possible outcomes for the event is N(Event (Two dice rolled))

=6^2

=36

1. P (sum is equal to 1) = 0 zero null nada none.
2. P(sum is less than or equal to 4) =

N (Event (sum is less than or equal to 4)/N (Event (Two dice rolled))

=6/36

=1/6=0.166=16.66%

1. P(sum is divisible by 2 and 3)

=N (Event (sum is divisible by 2 and 3)) /N (Event (two dice rolled)

=6/36

=1/6 = 0.16 = 16.66%

Q5) A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

1. Number of non-blue balls (red + green) = 2 (red) + 3 (green) = 5

Total number of balls = 2 (red) + 3 (green) + 2 (blue) = 7

Probability of drawing a non-blue ball on the first draw = (Number of non-blue balls) / (Total number of balls) = 5/7

for the second draw, since one non-blue ball has already been drawn

Number of non-blue balls remaining = 5 - 1 = 4

Probability of drawing a non-blue ball on the second draw = (Number of non-blue balls remaining) / Total number of balls remaining = 7 - 1 = 6

(Total number of balls remaining) = 4/6

Overal probability:

Probability (none of the balls drawn is blue) = (5/7) \* (4/6) = (5/7) \* (2/3) = 10/21

So, the probability that none of the balls drawn is blue is 10/21.

Q6) Calculate the Expected number of candies for a randomly selected child

Below are the probabilities of count of candies for children (ignoring the nature of the child-Generalized view)

|  |  |  |
| --- | --- | --- |
| CHILD | Candies count | Probability |
| A | 1 | 0.015 |
| B | 4 | 0.20 |
| C | 3 | 0.65 |
| D | 5 | 0.005 |
| E | 6 | 0.01 |
| F | 2 | 0.120 |

Child A – probability of having 1 candy = 0.015.

Child B – probability of having 4 candies = 0.20

1. To calculate the expected number of candies for a randomly selected child, you can multiply each child's candy count by their respective probability and then sum up these values.

Here's how you can calculate it:

Expected Number of Candies = (Probability of Child A having 1 candy) \* (Candies for Child A) + (Probability of Child B having 4 candies) \* (Candies for Child B) + (Probability of Child C having 3 candies) \* (Candies for Child C) + (Probability of Child D having 5 candies) \* (Candies for Child D) + (Probability of Child E having 6 candies) \* (Candies for Child E) + (Probability of Child F having 2 candies) \* (Candies for Child F)

Expected Number of Candies = (0.015 \* 1) + (0.20 \* 4) + (0.65 \* 3) + (0.005 \* 5) + (0.01 \* 6) + (0.120 \* 2)

Expected Number of Candies = 0.015 + 0.80 + 1.95 + 0.025 + 0.06 + 0.24

Expected Number of Candies = 3.115

So, the expected number of candies for a randomly selected child is 3.115 candies.

Q13) What is the nature of skewness when mean and median of data are equal?

Ans : No Skwness is present we have a perfect symmetrical distribution

Q14) What is the nature of the skweness when mean>median?

Ans: Skwness and tail is towards Right

Q15) what is the nature of the skwness when median>mean?

Ans: Skwness and Tail is towards left

Q16) What does positive kurtosis value indicates for a data?

Ans: Positive Kurtosis means the curve is more peaked and it is Leptokurtic

Q17) what does negative Kurtosis value indicates for a data ?

Ans: Negative Kurtosis means the curve will be flatter and boarder

Q18) What can we say about the distribution of the data?

Ans) The above Boxplot is not normally distributed the median is towards the higher value.

What is nature of skewness of the data?

Ans: The data is a skewed towards left. The whisker range of minimum value is greater than maximum

What will the IQR of the data?

Ans: The Inter Quantile Range =Q3 Upper quartile-Q1 Lower Quartile-18-10 = 8

Q19) Comment on the below Boxplot visualizations?

Ans: First there are no outliers. Second both the box plot shares the same median that is approximately in a range between275 to 250 and they are normally distributed with zero to no skwness neither at the minimum or maximum whisker range.

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