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

Q1) Identify the Data type for the Following:

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 | Ordinal |
| Level of Agreement | Ordinal |
| IQ(Intelligence Scale) | Ratio |
| Sales Figures | Interval |
| Blood Group | Nominal |
| Time Of Day | Ratio |
| Time on a Clock with Hands | Ratio |
| Number of Children | Ordinal |
| Religious Preference | Nominal |
| Barometer Pressure | Ratio |
| SAT Scores | Ratio |
| Years of Education | Interval |
|  |  |

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

Ans - Three coin are tossed, the no. of possible combination = 2^3 = 8

The combination are HHH, THH, HTH, HHT, TTH, THT, HTT, TTT.

Ask – find the prob. That two head and one tail are obtained?

No. of combination that have two heads and one tail= 3(HHT, HTH, TTH)

The probability (P) of two head and one tail when three coin are tossed

P(two head and one tail) = no. of possible combination

P=3/8 = 0.375

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

1. Equal to 1
2. Less than or equal to 4
3. Sum is divisible by 2 and 3

Ans – two dice are rolled,

n(S) = { (1,1),(1,2),(1,3),(1,4),(1,5),(1,6),

(2,1),(2,2),(2,3),(2,4),(2,5),(2,6),

(3,1),(3,2),(3,3),(3,4),(3,5),(3,6),

(4,1),(4,2),(4,3),(4,4),(4,5),(4,6),

(5,1),(5,2),(5,3),(5,4),(5,5),(5,6),

(6,1),(6,2),(6,3),(6,4),(6,5),(6,6) }

n(S) = 36.

Conditions - 1) Sum is equal to 1 - n(A) = ‘0’ zero or null

2) Sum is less than or equal to 4 – n(B) = 6

n(B)/n(S) = 6/36 = 1/6 = 0.1666 = 16.66%

3) sum is divisible by 2 and 3 – n(C) = 6

n(C) / n(S) = 6/36 = 1/6 = 0.1666 = 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?

Ans- total number of balls= 2+3+2 =7

S be the sample space.

n(S) = no. of ways of drawing 2 balls out of 7

= 7!/2! = (7\*6)/(2\*1) = 21

E = drawing 2 ball, none of which is blue

n(E) = no. of ways of drawing 2 balls out of 2+3 balls

=5!/2! = (5\*4)/(2\*1) = 10

P(E) = n(E)/n(S) =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

Ans - the probabilities of count of candies for children (ignoring the nature of the child)

Child A – probability of having 1 candy = 0.015.

Child B – probability of having 4 candies = 0.20

i.e (0.015\*1)+(0.20\*4)+(0.65\*3)+(0.005\*5)+(0.01\*6)+(0.120\*2)

= 3.09

Q8) Calculate Expected Value for the problem below

1. The weights (X) of patients at a clinic (in pounds), are

108, 110, 123, 134, 135, 145, 167, 187, 199

Assume one of the patients is chosen at random. What is the Expected Value of the Weight of that patient?

Ans - Expected Value  =  ∑ ( probability  \* Value )

 ∑ P(x).E(x)

there are 9 patients

Probability of selecting each patient = 1/9

Ex  108, 110, 123, 134, 135, 145, 167, 187, 199

P(x)  1/9  1/9   1/9  1/9   1/9   1/9   1/9   1/9  1/9

Expected Value  =  (1/9)(108) + (1/9)110  + (1/9)123 + (1/9)134 + (1/9)135 + (1/9)145 + (1/9(167) + (1/9)187 + (1/9)199

= (1/9) \*( 108 + 110 + 123 + 134 + 135 + 145 + 167 + 187 + 199)

= (1/9)\* (  1308)

= 145.33

**10) Draw inferences about the following boxplot & histogram**



Ans- This graph histogram showing that the distribution of the data is Asymmetric. This is right skewed and we also say that the this is positively skewed.

The boxplot showing positively skewness of the distribution.

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

Ans – No skewness is present when we have a perfect symmetrical distribution.

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

Ans – skewness towards right .

Q15) What is the nature of skewness when median > mean?

Ans - skewness towards left .

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

Ans – the curve it is leptokurtosis.

Q17) What does negative kurtosis value indicates for a data?

Ans – the curve is flatter

Q18) Answer the below questions using the below boxplot visualization.

Ans -



1. What can we say about the distribution of the data?
2. What is nature of skewness of the data?
3. What will be the IQR of the data (approximately)?

Ans – 1) It is not normally distributed the median is towards the higher value

2) the data is a skewness towards left

3)Inter quantile range = UQR (upper quantile range)-LQR(lower quantile range)

Q19) Comment on the below Boxplot visualizations?



Draw an Inference from the distribution of data for Boxplot 1 with respect Boxplot 2.

Ans – 1)there is no outliers

2)both box plots median is approximately in range between 250 to 275