Q1) Identify the Data type for the Following:

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

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	Nominal
Fahrenheit Temperature	Interval
Height	Ratio
Type of living accommodation	Nominal
Level of Agreement	Ordinal
IQ(Intelligence Scale)	Interval
Sales Figures	Ratio
Blood Group	Nominal
Time Of Day	Interval

Time on a Clock with Hands	Interval
Number of Children	Nominal
Religious Preference	Ordinal
Barometer Pressure	Interval
SAT Scores	Ordinal
Years of Education	Ratio

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

Ans:- Let S be the sample space them

S=[(HHH), (HHT), (HTH), (THH), (TTH), (THT), (HTT), (TTT)]

Then the event

X={HHT,HTH,THH}

Let X be a random variable denoting the two heads and one tail.

P(X)= probability of occurrence of 2 heads and 1 tail.

=P(HHT)+P(HTH)+P(THH)

$=\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$

$P(X)=\frac{3}{8}=0.375$

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

a) Equal to 1
b) Less than or equal to 4
c) Sum is divisible by 2 and 3

Ans:- Let S be the Sample Space

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) }

a) favourable outcome (sum equal to 1) = 0 {i.e. not possible that sum always exceed to 1}
P(A)=0/36=0

b) favourable outcome (sum less than or equal to 4) = 6

P(B)=6/36=1/6=0.16

c) favourable outcome (sum is divisible by 2 & 3) = 24

P(C)=6/36=0.16

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 Let S be the sample space.

Then, n(S) = Number of ways of drawing 2 balls out of 21 Let E = Event of drawing 2 balls, none of which is blue.

n(E) = Number of ways of drawing 2 balls out of (2 + 3)

balls. n(E) = 10

P(E) = 10/21 = 0.47

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 :- Expected number of candies for a randomly selected child

= 1 * 0.015 + 4*0.20 + 3 *0.65 + 5*0.005 + 6 *0.01 + 2 * 0.12

= 0.015 + 0.8 + 1.95 + 0.025 + 0.06 + 0.24

Expected candies = 3.09

Q8) Calculate Expected Value for the problem below

a) The weights (X) of patients at a clinic (in pounds), are
108, 110, 123, 134, 135, 145, 167, 187, 199

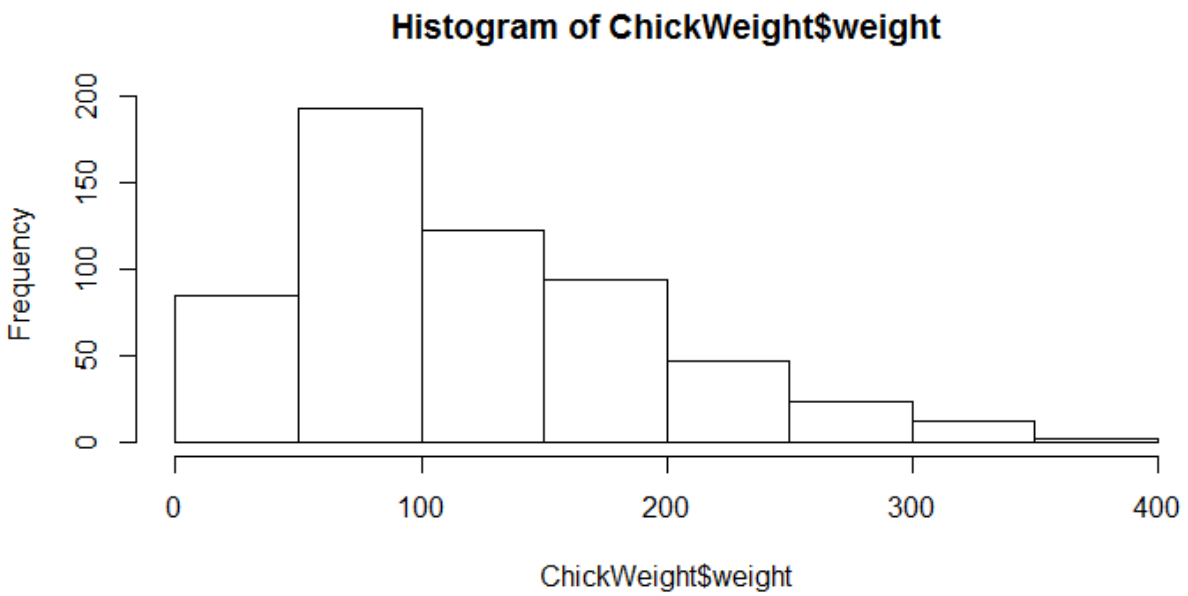
Assume one of the patients is chosen at random. What is the Expected Value of the Weight of that patient?

Ans :- Expected Value = (Sum of all values * Probability of each value)

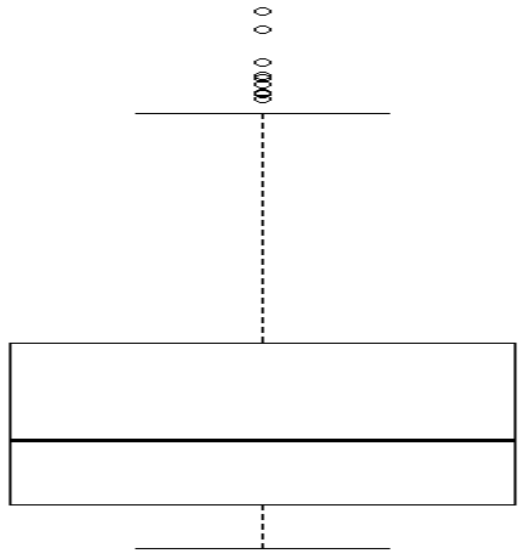
E(X) = (108 + 110 + 123 + 134 + 135 + 145 + 167 + 187 + 199) * (1/ 9)

E(X) = 145.33

Q10) Draw inferences about the following boxplot & histogram



Ans : The histograms peak has right skew and tail is on right. Mean > Median. We have outliers on the higher side.



Ans : The boxplot has outliers on the maximum side.

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

Ans :- No skewness is present we have a perfect symmetrical distribution.

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

Ans : Skewness and tail is towards Right.

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

Ans : Skewness and tail is towards left.

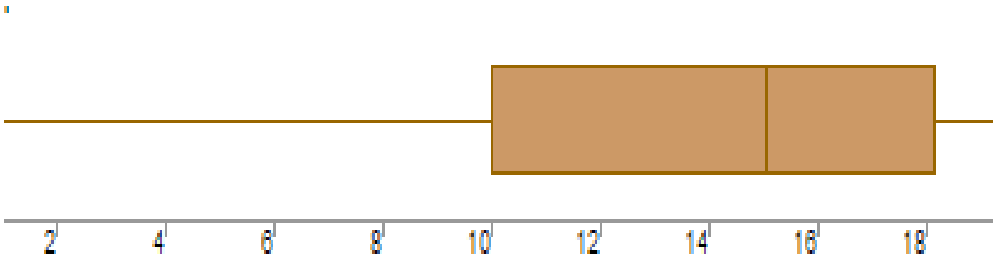
Q16) What does positive kurtosis value indicates for a data ?

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 broader.

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



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

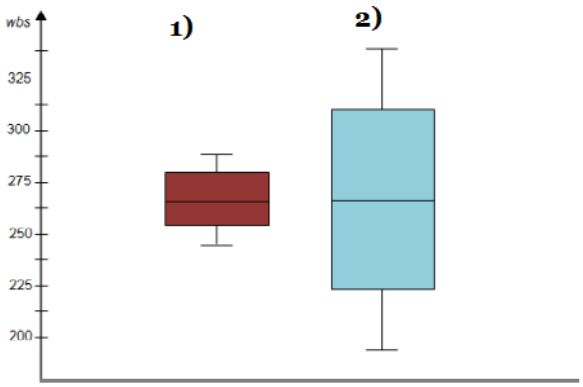
What is nature of skewness of the data?

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

What will be the IQR of the data (approximately)?

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

Q19) Comment on the below Boxplot visualizations?



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

Ans : First there are no outliers. Second both the box plot shares the same median that is approximately in a range between 275 to 250 and they are normally distributed with zero to no skewness neither at the minimum or maximum whisker range.