Statistics Assignment: -

* Powered by: - Raj sir (TOPS TECHNOLOGY)
* Topics: - Basic Statistics using Data Analyze

Topic 1: - Measure of the Central tendencies mean +median +mode +std +variance

1. ***Business Problem: A retail store wants to analyse the sales data of a particular***

***Product category to understand the typical sales performance and make strategic***

***decisions.***

Data:

Let's consider the weekly sales data (in units) for the past month for a specific product

Category:

Week 1: 50 units

Week 2: 60 units

Week 3: 55 units

1. Week 4: 70 units

Answer: - mean p(x): - sum weekly sales

Number weeks

(50+60+55+70)

4

235/4

P(x) =58.45

Median: - 1st) step: -set all the sales of the week sales ascending order

* 50+55+60+70

2nd) step is the mean value which are the data set in available in data set

58.45 in (55 or 60) between the consider this mean values

Median (n+1/2)

= 55+60/2

= 115/2

= 57.5 units

Mode: - mode is the most commonly repeatable value is the mode value

50+55+60+70

Ans. = (There are the no repeatable value that we are sales are the no data.)

Range: -range will be defines as the highest and lowest values we known as the range.

Range = Highest – lowest

70 - 50

= 20 units are the range value

Standard Deviation: - Std is the stand for the find the data set will be actual (center point) will be what is the deference in graph.

1. Mean value = 58.75
2. Difference between = mean value – own sales data

50-58.75 = -8.75

55-58.75 = -3.75

60-58.75= 1.25

70-58.75 = 11.25

[(58.75-50 + (60-58.75) +(55-58.75) + (70-58.75) /4)]

[(58.75) +) (1.25) +(3.75) +(11.25) / 4]

[3456.5625 / 4]

Square root = 864.140625

29.38

Weekly 29.38 units approximaticallty decision between data.

1. Business Problem: A restaurant wants to analyse the waiting times of its customers to understand the typical waiting experience and improve service efficiency. Data: Let's consider the waiting times (in minutes) for the past 20 customers: 15+ 10+ 20+ 25+ 15+ 10+ 30+ 20+ 15+ 10+ 10+ 25+ 15+ 20+ 20+ 15+ 10+ 10+ 20+ 25

Question: 1. Mean: What is the average waiting time for customers at the restaurant 2. Median: What is the typical or central waiting time experienced by customers?

3. Mode: Are there any recurring or most frequently occurring waiting times for customers?

By answering these questions using the mean+ median+ and mode+ the restaurant can gain insights into the average waiting time+ identify any common or peak waiting periods+ and make informed decisions to optimize the customer service process+ such as adjusting staffing levels+ streamlining operations+ or implementing strategies to reduce waiting times.

Answer: - mean: - 15+10+20+25+15+10+30+20+15+10+10+25020+15+10+120+13+20+30

Mean =

5+7+8+10+12+15+18+20+22+25+30+35+40+45+50

15

P(x)= 21.3333

median: - 1st step: - all the dataset the sort the ascending order customer service process data set

5+7+8+10+12+15+18+20+20+25+30+35+40+40+50

Then mean value is the 21.33 all the data set is the center value range is the

8+9/2

M(x) =12.5

Mode: -mode the most frequently multi time repeated data from the customer process service data set

20 +40 data are the most repeated waiting time

* 20+40 times the customer service process+ such as adjusting staffing levels+ streamlining operations+ or implementing strategies to reduce waiting times.

Business Problem: A car rental company wants to analyze the rental durations of its customers to understand the typical rental period and optimize its pricing and fleet management strategies

. Data: Let's consider the rental durations (in days) for a sample of 50 customers:

3+ 2+ 5+ 4+ 7+ 2+ 3+ 3+ 1+ 6+ 4+ 2+ 3+ 5+ 2+ 4+ 2+ 1+ 3+ 5+ 6+ 3+ 2+ 1+ 4+ 2+ 4+ 5+ 3+ 2+ 7+ 2+ 3+ 4+ 5+ 1+ 6+ 2+ 4+ 3+ 5+ 3+ 2+ 4+ 2+ 6+ 3+ 2+ 4+ 5

Question: 1. Mean: What is the average rental duration for customers at the car rental company?

2. Median: What is the typical or central rental duration experienced by customers?

3. Mode: Are there any recurring or most frequently occurring rental durations for customers?

By answering these questions using the mean+ median+ and mode+ the car rental company can gain insights into the average rental duration+ understand the most common rental periods+ and make informed decisions regarding pricing+ fleet size+ and availability. Additionally, + this analysis can help the company optimize resource allocation+ plan for peak demand periods+ and enhance customer satisfaction by aligning service offerings with customers' typical rental needs.

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Answer: - 1

mean process: -

Total rental durations customer sample

Quantity of sample

P(x) 3+2+5+4+7+2+3+3+1+6+4+2+3+5+2+4+2+1+3+5+6+3+2+1+4+2+4+5+3+2+7+2+3+4+5+1+6+2+4+3+5+3+2+4+2+6+3+2+4+5

50

= 3.46

1. Median :- most mean value is the value for the which range to outcome Is the dataset

3.46 is the 2 and 3 value between

M = (25th value + 26th value)

2

2+3/2

M = 2.5

Mode :- most repeated value is the 2+3 is the mode answer

***Topic: -2 Question on Measure of the Dispersion***

1. ) Problem: A manufacturing company wants to analyze the production output of a specific machine to understand the variability or spread in its performance.

Data: Let's consider the number of units produced per hour by the machine for a sample of 10 working days:

Day 1: 120 units

Day 2: 110 units

Day 3: 130 units

Day 4: 115 units

Day 5: 125 units

Day 6: 105 units

Day 7: 135 units

Day 8: 115 units

Day 9: 125 units

Day 10: 140 units

Question: - 1 Range What is the range of the Production Output for the Machine.

Range = highest value - Lowest value

= 140 - 105

= 35

Mean value 120+110+130+115+125+105+135+115+125+140

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10

= 1185/10

= 118.5

Variance = variance is the using for the mean central point value is the actually difference between mean value measure the frequency level.

Variance = Mean answer value - own dataset

(120-118.5) ²+

(110 -118.5) ²+

(130-118.5) ² +

(115-118.5) ²+

(125 – 118.5) ²+

(105 – 118.5) ²+

/10 = 1269.5/10

= 126.95

Std = actual data set around the mean value is the actually centre point is the check it the usibibtlty I use for the standard deviation function.

Standard deviation is the variance value (square)

√126.95

= 11.27

Question: - 2

Problem: A retail store wants to analyze the sales of a specific product to understand the variability in daily sales and assess its inventory management.

Data:

Let's consider the daily sales (in dollars) for the past 30 days:

$500+ $700+ $400+ $600+ $550+ $750+ $650+ $500+ $600+ $550+ $800+ $450+ $700+ $550+ $600+ $400+ $650+ $500+ $750+ $550+ $700+ $600+ $500+ $800+ $550+ $650+ $400+ $600+ $750+ $550

Questions: 1. Range: What is the range of the daily sales?

2. Variance: What is the variance of the daily sales?

3. Standard Deviation: What is the standard deviation of the daily sales?

: 1. Range: What is the range of the daily sales?

$500+ $700+ $400+ $600+ $550+ $750+ $650+ $500+ $600+ $550+ $800+ $450+ $700+ $550+ $600+ $400+ $650+ $500+ $750+ $550+ $700+ $600+ $500+ $800+ $550+ $650+ $400+ $600+ $750+ $550

Range = 800- 400

= 300

Daily sales report is the 300$ inventory management.

Variance: What is the variance of the daily sales?

Variance: - 1sr step is the find the excepted value(mean)

$500+$700+ $400+$600+$550+ $750+ $650+ $500+ $600+ $550+ $800+ $450+ $700+ $550+ $600+ $400+ $650+ $500+ $750+ $550+ $700+ $600+ $500+ $800+ $550+ $650+ $400+ $600+ $750+ $550

30

= 18000/30

=600$

Variance (500-600) ²+(700-600) ² …………………. + (550 - 600) ² /30

= 10000+10000+2600

$22083.33

Standard deviation: - std is the root of the variance and is measure of the variance value

√ 220833

= 148

1. Range: The range of the daily sales is $400.
2. Variance: The variance of the daily sales is approximately $22083.33.
3. Standard Deviation: The standard deviation of the daily sales is approximately = $148.66

Question: - 3

Problem: An e-commerce platform wants to analyze the delivery times of its shipments to understand the variability in order fulfilment and optimize its logistics operations.

Data:

Let's consider the delivery times (in days) for a sample of 50 shipments:

3+ 5+ 2+ 4+ 6+ 2+ 3+ 4+ 2+ 5+ 7+ 2+ 3+ 4+ 2+ 4+ 2+ 3+ 5+ 6+ 3+ 2+ 1+ 4+ 2+ 4+ 5+ 3+ 2+ 7+ 2+ 3+ 4+ 5+ 1+ 6+ 2+ 4+ 3+ 5+ 3+ 2+ 4+ 2+ 6+ 3+ 2+ 4+ 5+ 3

Questions: 1. Range: What is the range of the delivery times?

Range = maximum value – minimum value

7-1

6

2. Variance: What is the variance of the delivery times?

Mean value: - Let's consider the delivery times (in days) for a sample of 50 shipments:

3+ 5+ 2+ 4+ 6+ 2+ 3+ 4+ 2+ 5+ 7+ 2+ 3+ 4+ 2+ 4+ 2+ 3+ 5+ 6+ 3+ 2+ 1+ 4+ 2+ 4+ 5+ 3+ 2+ 7+ 2+ 3+ 4+ 5+ 1+ 6+ 2+ 4+ 3+ 5+ 3+ 2+ 4+ 2+ 6+ 3+ 2+ 4+ 5+ 3 / 50

=3.22

(3-3.22) ²+ (5-3.22) ² + …………………………………………………. (3.3.22) / 50

= 1.1564

Std values = standard deviation is the square the standard deviation.

v 1.1564

question: -

1. Problem: A company wants to analyze the monthly revenue generated by one of its products to understand its performance and variability.

Data:

Let's consider the monthly revenue (in thousands of dollars) for the past 12 months

: $120+ $150+ $110+ $135+ $125+ $140+ $130+ $155+ $115+ $145+ $135+ $130

Questions:

1. Measure of Central Tendency: What is the average monthly revenue for the product?

Measure central tendency: - is the considered as the as The actual data is the centre point is the exist.

Mean: - ($120+ $150+ $110+ $135+ $125+ $140+ $130+ $155+ $115+ $145+ $135+ $130)/ 12

1610/12

= 134.17

2. Measure of Dispersion: What is the range of monthly revenue for the product?

The range the find the maximum value – minimum values data set. we arrange the data in ascending.

110+ $115+ $120+ $125+ $130+ $130+ $135+ $135+ $140+ $145+ $150+$15

Range = Maximum - minimum

155 -110

= 45

Question: - 5) Problem: A survey was conducted to gather feedback from customers regarding their satisfaction with a particular service on a scale of 1 to 10.

Data:

Let's consider the satisfaction ratings from 50 customers:

Questions:

1. Measure of Central Tendency: What is the average satisfaction rating?

Mean = total feedback value / count of the feedback

8+ 7++9+ 6+ 7+ 8+ 9+ 8+ 7+ 6+ 8+ 9+ 7+ 8+ 7+ 6+ 8+ 9+ 6+ 7+ 8+ 9+ 7+ 6+ 7+ 8+ 9+ 8+ 7+ 6+ 9+ 8+ 7+ 6+ 8+ 9+ 7+ 8+ 7+ 6+ 9+ 8+ 7+ 6+ 7+ 8+ 9+ 8+ 7+ 6 / 50

= 7.54

2. Measure of Dispersion: What is the standard deviation of the satisfaction ratings?

((8-7.54) ² + (7-7.54) ² + ………………………………… (6+7.54) ² /50

6.7048/ 50

0.1341

1. Standard deviation: - std is the square root of the variance value.

√ 0.1341

= 0.3661

Measre of the central tendency is the = 7.54

Variance value is the = 0.1341

Standard deviation = 0.3661

Question :- 6 )

Problem :A company wants to analyze the customer wait times at its call centre to assess the efficiency of its customer service operations.

Data:

Let's consider the wait times (in minutes) for a sample of 100 randomly selected customer calls:

10+ 15+ 12+ 18+ 20+ 25+ 8+ 14+ 16+ 22+ 9+ 17+ 11+ 13+ 19+ 23+ 21+ 16+ 24+ 27+ 13+ 10+ 18+ 16+ 12+ 14+ 19+ 21+ 11+ 17+ 15+ 20+ 26+ 13+ 12+ 14+ 22+ 19+ 16+ 11+ 25+ 18+ 16+ 13+ 21+ 20+ 15+ 12+ 19+ 17+ 14+ 16+ 23+ 18+ 15+ 11+ 19+ 22+ 17+ 12+ 16+ 14+ 18+ 20+ 25+ 13+ 11+ 22+ 19+ 17+ 15+ 16+ 13+ 14+ 18+ 20+ 19+ 21+ 17+ 12+ 15+ 13+ 16+ 14+ 22+ 21+ 19+ 18+ 16+ 11+ 17+ 14+ 12+ 20+ 23+ 19+ 15+ 16+ 13+ 18

Questions:

1. Measure of Central Tendency: What is the average wait time for customers at the call centre?

10+ 15+ 12+ 18+ 20+ 25+ 8+ 14+ 16+ 22+ 9+ 17+ 11+ 13+ 19+ 23+ 21+ 16+ 24+ 27+ 13+ 10+ 18+ 16+ 12+ 14+ 19+ 21+ 11+ 17+ 15+ 20+ 26+ 13+ 12+ 14+ 22+ 19+ 16+ 11+ 25+ 18+ 16+ 13+ 21+ 20+ 15+ 12+ 19+ 17+ 14+ 16+ 23+ 18+ 15+ 11+ 19+ 22+ 17+ 12+ 16+ 14+ 18+ 20+ 25+ 13+ 11+ 22+ 19+ 17+ 15+ 16+ 13+ 14+ 18+ 20+ 19+ 21+ 17+ 12+ 15+ 13+ 16+ 14+ 22+ 21+ 19+ 18+ 16+ 11+ 17+ 14+ 12+ 20+ 23+ 19+ 15+ 16+ 13+ 18

/ 100

= 16.83

1. Measure of Dispersion: What is the range of wait times for customers at the call centre?

Range value = maximum value – minimum value

27-8

=19

3. Measure of Dispersion: What is the standard deviation of the wait times for customers at the call centre?

Measure of the dispersion: - 1) mean value: - excepted centre point value

P(x) = 16.83

1. Variance = difference between mean value frequency level.

[ (10-16.83) +(15-16.83) + (18-16.83) ……………………………… (18-16.83) ] ² / 50

95.8031 /50

0.9580

3) standard deviation: - std is the variance value root value.

1.1

√0.9580

= 0.9787

Answer: ---

Range: - 19

Std:- 0.9787

Mean: - 16.03

Variance: - 0.9580

Question: - 7)

Problem: A transportation company wants to analyze the fuel efficiency of its vehicle fleet to identify any variations across different vehicle models.

Data:

Let's consider the fuel efficiency (in miles per gallon+ mpg) for a sample of 50 vehicles:

Model: A: 30+ 32+ 33+ 28+ 31+ 30+ 29+ 30+ 32+ 31+

Model B: 25+ 27+ 26+ 23+ 28+ 24+ 26+ 25+ 27+ 28+

Model C: 22+ 23+ 20+ 25+ 21+ 24+ 23+ 22+ 25+ 24+

Model D: 18+ 17+ 19+ 20+ 21+ 18+ 19+ 17+ 20+ 19+

Model E: 35+ 36+ 34+ 35+ 33+ 34+ 32+ 33+ 36+ 34

Questions: 1. Measure of Central Tendency: What is the average fuel efficiency for each vehicle model?

Mean: -

model-A: - 30+ 32+ 33+ 28+ 31+ 30+ 29+ 30+ 32+ 31+/10 = 30.6

Model-B: - 25+ 27+ 26+ 23+ 28+ 24+ 26+ 25+ 27+ 28+/10 = 26.2

Model-C: - 22+ 23+ 20+ 25+ 21+ 24+ 23+ 22+ 25+ 24+ /10 = 23.7

Model-D: - 22+ 23+ 20+ 25+ 21+ 24+ 23+ 22+ 25+ 24+ /10 = 18.9

Model-E: - 22+ 23+ 20+ 25+ 21+ 24+ 23+ 22+ 25+ 24+ /10 = 34.0

2. Measure of Dispersion: What is the range of fuel efficiency for each vehicle model?

RANGE VALUE MODEL WISE = MODEL = A

MODEL = A MAXIMUM VAUE - MINIMUM VALUE = 5

MODEL = B MAXIMUM VAUE - MINIMUM VALUE = 5

MODEL = C MAXIMUM VAUE - MINIMUM VALUE = 5

MODEL = D MAXIMUM VAUE - MINIMUM VALUE = 5

MODEL = E MAXIMUM VAUE - MINIMUM VALUE = 5

3. Measure of Dispersion: What is the variance of the fuel efficiency for each vehicle model?

VARIANCE = MEAN Value difference frequency level

MODEL = A = (30-30.6)+ (32-30.6)+ (33-30.6)+ (28-30.6)+ (31-30.6)+ (30-30.6)+ (29-30.6)+ (30-30.6)+ (32-30.6)+ (31+-30.6)/10

= 1.04MPG²

MODEL = B = (25-26.2) + (27-26.2) + (26-26.2) + (23-26.2) + (28-26.2) + (24-26.2) + (26-26.2) + (25-26.2) + (27-26.2) + (28-26.2) /10

= 2.16MP²

MODEL =C =(25-23.7)+( 27-23.7)+ (26-23.7)+ (23-23.7)+ (28-23.7)+ (24-23.7)+ (26-23.7)+ (25-23.7)+( 27-23.7)+ (28-23.7)+/10

= 2.63MP²

MODEL =D=(18-18.9)+ (17-18.9)+ (19-18.9)+( 20-18.9)+ (21-18.9)+ (18-18.9)+(19-18.9)+ (17-18.9)+ (20-18.9)+ (19-18.9)+/10

=1.21MP²

MODEL =E =(35-34.0)+ (36-34.0)+ (34-34.0)+(35-34.0)+(33-34.0)+ (34-34.0)+ (32-34.0)+ (33-34.0)+ (36-34.0)+ (34-34.0)+/10

=0.9MP²

1. STANDARD DEVIATION: - square root of the variance values

Model A = √ 1.04 = 1.01980

Model B =√2.16 = 1.46

Model C =√2.63 = 1.62

Model-D = √1.21 = 1.1

Model-E = √0.9 = 0.94

Topic no = 3 Moore Statistics Question (covered topic is the): = [ quartiles+deciles+persantage +Frequency distribution]

8) Problem: A company wants to analyze the ages of its employees to understand the age distribution and demographics within the organization

. Data:

Let's consider the ages of 100 employees:

28+ 32+ 35+ 40+ 42+ 28+ 33+ 38+ 30+ 41+ 37+ 31+ 34+ 29+ 36+ 43+ 39+ 27+ 35+ 31+ 39+ 45+ 29+ 33+ 37+ 40+ 36+ 29+ 31+ 38+ 35+ 44+ 32+ 39+ 36+ 30+ 33+ 28+ 41+ 35+ 31+ 37+ 42+ 29+ 34+ 40+ 31+ 33+ 38+ 36+ 39+ 27+ 35+ 30+ 43+ 29+ 32+ 36+ 31+ 40+ 38+ 44+ 37+ 33+ 35+ 41+ 30+ 31+ 39+ 28+ 45+ 29+ 33+ 38+ 34+ 32+ 35+ 31+ 40+ 36+ 39+ 27+ 35+ 30+ 43+ 29+ 32+ 36+ 31+ 40+ 38+ 44+ 37+ 33+ 35+ 41+ 30+ 31+6 39+ 28

Questions: 1. Frequency Distribution: Create a frequency distribution table for the ages of the employees.

Frequency table is the = all the employee data which time consider in Frequency that is called the Frequency level

1) Desecrate (continues natural number positive natural number)

2) Continues Frequency distribution (-Range value (max- min) create range)

|  |  |
| --- | --- |
| age | Frequency(which time repeated the data ) |
| 27 | 3 |
| 28 | 5 |
| 29 | 6 |
| 30 | 6 |
| 31 | 8 |
| 32 | 4 |
| 33 | 7 |
| 34 | 4 |
| 35  36  37  38  39  40  41  42  43  44  45 | 8  4  5  6  6  6  4  3  3  4  2 |

1. Mode: What is the mode (most common age) among the employees?

Most repeated value in this Data Is the 31 age is the most repeated value frequency.\

31 = 8

Mode value is the = 31age

1. Median: What is the median age of the employees?

1) Median value is find the all the ages value is the sorted the ascending order = 27+27+27+28+28+28+……………………. +4042+44

1. All the number are the even that’s why

Median = n+1 /2

50+1/2

51/2

25.5

(25and 26 value age is the median central point is the substituted)

25age= (31+31/2)

62/2

= 31 age value is the most centre point in this data

4. Range: what is the range of ages among the employees?

Range = Maximum value – minimum value

45-27

= 18

Frequency distribution: -

Median: - 31

Mode: - 31

Range: - 18

Problem = (9)

:A retail store wants to analyze the purchase amounts made by customers to understand their spending habits

. Data:

Let's consider the purchase amounts (in dollars) for a sample of 50 customers:

56+ 40+ 28+ 73+ 52+ 61+ 35+ 40+ 47+ 65+ 52+ 44+ 38+ 60+ 56+ 40+ 36+ 49+ 68+ 57+ 52+ 63+ 41+ 48+ 55+ 42+ 39+ 58+ 62+ 49+ 59+ 45+ 47+ 51+ 65+ 41+ 48+ 55+ 42+ 39+ 58+ 62+ 49+ 59+ 45+ 47+ 51+ 65+ 43+ 58

Questions: 1. Frequency Distribution: Create a frequency distribution table for the purchase amounts.

|  |  |
| --- | --- |
| Purchase Amount | Frequency |
| 28 | 1 |
| 35 | 1 |
| 36 | 1 |
| 38 | 1 |
| 39 | 2 |
| 40 | 3 |
| 41 | 2 |
| 42 | 2 |
| 43 | 1 |
| 44 | 1 |
| 45 | 2 |
| 47 | 3 |
| 48 | 2 |
| 49 | 1 |
| 51 | 2 |
| 52 | 3 |
| 55 | 2 |
| 56  57  58  58  59  60  61  62  63  65  68  73 | 2  1  2  2  2  1  1  2  1  3  1  1 |

2. Mode: What is the mode (most common purchase amount) among the customers?

\* Most repeated value us the 40+47+49+52+65 is the amount more than 3 times max repeated value.

1. Median: What is the median purchase amount among the customers?

Median value is the all the number are the ascending order.

=> 28+35+36+38+38+39+………….73

Total data is the 50

Median = total data + 1 /2

(50/2)

25 or 26 value is the median value.

Median = (49+51)/2

100/2

==50

1. Interquartile Range: What is the interquartile range of the purchase amounts?

Even = number Q1 = (n+1)/2 = q1 odd number = (direct central number)

Q2 = (n+1)/2 = q3

Interquartile value is the 75% of the data all the data are the 4 part divided 25%+25%25%+25%

Inter quartile include the 75 % data is the

q3 = 75% data upper highest value = (n+1) \* 3/4

Q2 = median centre point value = (n+1) \*2/4

Q1 = 25% data lower quartier value = (n+1)\*1/4

Total =50 data

(first half )

(second half) q1= 38 [ 12 data point Is the ascending orderd]

[ 25 % data ] [25%data ] q3 = 58[ 37 data is the ascending ordered]

(Median value )

Inter quartile = [Q3-Q1]

= 58-39

= 19

Quartiles example: -

5+8+12+15+20+21+24

1st step – all the data is the sorted the ascending order

5+8+12+15+20+21+24

2nd step =

Q1 = (n+1) \*1/4

(7+1) \*1/4

8\*1/4

2nd value lower value = 8

Q2 = (n+1) \* 2/4

(7+1) \*2/4

8\*2/4

16/4

4th value is the medium value = 15

Q3 = (n+1) \*3/4

= (8+1) \*3/4

= 9\*3/4

27/4

6.5th value is the higher quartiles = 21

Q23 = (n+1)\*23/4

(8+23)\*23/4

178

Inter quartile = this is the one types of the range value.

Maxvalue-min value

= q3-q1

=21-8

= 13

Persantile = persantile is the all over data is the devided to the 100 the parts

Formula = p(1)= (1/100)\*(n+1)

N= total count of the data set

P()= number of the persantage

P(25)=(25/100)\*(30+1) p(50)= (50/100)\*(n+1) p(75)=(75/100)\*(n+1)

= 6.25\*31 = 0.25\*31 = 0.75\*31

= 193.75 =15.5 = 23.2

620

Finally quartile formuala = (n+1)\* (qvalue/4

Because (100/4) 25 %20 = 4 something data is th fetch the value.

Question = 10) Problem

: A manufacturing company wants to analyze the defect rates of its production line to identify the frequency of different types of defects.

Data:

Let's consider the types of defects and their corresponding frequencies observed in a sample of 200 products: Defect Type: A+ B+ C+ D+ E+ F+ G Frequency: 30+ 40+ 20+ 10+ 45+ 25+ 30 Questions:

1. Bar Chart: Create a bar chart to visualize the frequency of different defect types.

|  |  |
| --- | --- |
| Detect type | Frecuency |
| a | 30 |
| B | 40 |
| C | 20 |
| D | 10 |
| E | 45 |
| F | 25 |
| G | 30 |

1. Most Common Defect: Which defect type has the highest frequency?

Most common highest type value level frequency repeated value is the - 45

1. Histogram: Create a histogram to represent the defect frequencies. By answering these questions using a bar chart and histogram+ the manufacturing company can visually understand the g

10-19 = d

20-29 = c++f

30-39 = a+g

40-49 = b+e

distribution of defect types+ identify the most common defect+ and prioritize quality control efforts to address the prevalent issues.

Question =11)

Problem:

A survey was conducted to gather feedback from customers about their satisfaction levels with a specific service on a scale of 1 to 5.

Data: Let's consider the satisfaction ratings from 100 customers: Ratings:

4+ 5+ 3+ 4+ 4+ 3+ 2+ 5+ 4+ 3+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 3+ 4+ 3+ 2+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4+ 3+ 4+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4+ 3+ 4+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4

Questions: 1. Histogram: Create a histogram to visualize the distribution of satisfaction ratings.

Rating Frequency

1 0

2 10

3 30

4 40

5 20

2. Mode: Which satisfaction rating has the highest frequency?

Most repetitive value is the 4 number 40-time frequency.

1. Bar Chart: Create a bar chart to display the frequency of each satisfaction rating.

Rating Frequency

1 0

2 10

3 30

4 40

5 20

Question – 12 Problem: A company wants to analyze the monthly sales figures of its products to understand the sales distribution across different price ranges

. Data:

Let's consider the monthly sales figures (in thousands of dollars) for a sample of 50 products:

Sales:

35+ 28+ 32+ 45+ 38+ 29+ 42+ 30+ 36+ 41+ 47+ 31+ 39+ 43+ 37+ 30+ 34+ 39+ 28+ 33+ 36+ 40+ 42+ 29+ 31+ 45+ 38+ 33+ 41+ 35+ 37+ 34+ 46+ 30+ 39+ 43+ 28+ 32+ 36+ 29+ 31+ 37+ 40+ 42+ 33+ 39+ 28+ 35+ 38+ 43

Questions: 1. Histogram: Create a histogram to visualize the sales distribution across different price ranges.

Sales range frequency

28-30 7

31-33 10

34-36 8

37-39 12

40-42 8

43-45 4

46-47 1

2. Measure of Central Tendency: What is the average monthly sales figure?

Measure of the central tendency is the mean.

Mean= [35+ 28+ 32+ 45+ 38+ 29+ 42+ 30+ 36+ 41+ 47+ 31+ 39+ 43+ 37+ 30+ 34+ 39+ 28+ 33+ 36+ 40+ 42+ 29+ 31+ 45+ 38+ 33+ 41+ 35+ 37+ 34+ 46+ 30+ 39+ 43+ 28+ 32+ 36+ 29+ 31+ 37+ 40+ 42+ 33+ 39+ 28+ 35+ 38+ 43] / 50

= 39.96

Median = (n+1)/2

= (50+1)/2

= 25.5

25+26 value is the central point

31+45/2

=53.5

Mode = most repeated value is the 42

3. Bar Chart: Create a bar chart to display the frequency of sales in different price ranges.

Sales range frequency

28-30 7

31-33 10

34-36 8

37-39 12

40-42 8

43-45 4

46-47 1

Problem : A company wants to analyze the sales performance of its products across different regions. Data: Let's consider the sales figures (in thousands of dollars) for a sample of 50 products in three regions:

Region 1: 45+ 35+ 40+ 38+ 42+ 37+ 39+ 43+ 44+ 41

+ Region 2: 32+ 28+ 30+ 34+ 33+ 35+ 31+ 29+ 36+ 37+

Region 3: 40+ 39+ 42+ 41+ 38+ 43+ 45+ 44+ 41+ 37

Questions:

1. Bar Chart: Create a bar chart to compare the sales figures across the three regions.

Region 1 | sales(numberic value)

Reqion 1 = 45+35+40+38+42+37+39+43+44+41

Region 2 = 32 28 30 34 33 35 31 29 36 37

Region 3 = 40 39 42 41 38 43 45 44 41 37

2. Measure of Central Tendency: What is the average sales figure for each region?

Central tendency is that is the mean individual all the region wise data find the average value .

Region 1 = (45+35+40+38+42+37+39+43+44+41)/ 10

= 39.4

Region 2 = (32 +28+ 30+ 34+ 33+ 35+ 31+ 29+ 36+ 37)/10

= 32.5

Region 3 : - (40 +39 +42+ 41+ 38+ 43 +45+ 44+ 41+ 37)/10

= 41.0

What is the range of sales figures in each region?

Range = highest value – lowest value

= region 1 = 45-35 = 10

Region 2 = 37-28 = 9

Region 3 = 45-37 = 8

Topic =4 measure of the skewness and kurtosis :-

1. 1) Question : A company wants to analyze the monthly returns of its investment portfolio to understand the distribution and risk associated with the returns

. Data: Let's consider the monthly returns (%) for the portfolio over a one-year period:

Returns: -

2.5+ 1.3+ -0.8+ -1.9+ 2.1+ 0.5+ -1.2+ 1.8+ -0.5+ 2.3+ -0.7+ 1.2+ -1.5+ -0.3+ 2.6+ 1.1+ -1.7+ 0.9+ -1.4+ 0.3+ 1.9+ -1.1+ -0.4+ 2.2+ -0.9+ 1.6+ -0.6+ -1.3+ 2.4+ 0.7+ -1.8+ 1.5+ -0.2+ -2.1+ 2.8+ 0.8+ -1.6+ 1.4+ -0.1+ 2.5+ -1.0+ 1.7+ -0.9+ -2.0+ 2.7+ 0.6+ -1.4+ 1.1+ -0.3+ 2.0

Questions: 1. Skewness: Calculate the skewness of the monthly returns.

Mean = [-2.5+ 1.3+ -0.8+ -1.9+ 2.1+ 0.5+ -1.2+ 1.8+ -0.5+ 2.3+ -0.7+ 1.2+ -1.5+ -0.3+ 2.6+ 1.1+ -1.7+ 0.9+ -1.4+ 0.3+ 1.9+ -1.1+ -0.4+ 2.2+ -0.9+ 1.6+ -0.6+ -1.3+ 2.4+ 0.7+ -1.8+ 1.5+ -0.2+ -2.1+ 2.8+ 0.8+ -1.6+ 1.4+ -0.1+ 2.5+ -1.0+ 1.7+ -0.9+ -2.0+ 2.7+ 0.6+ -1.4+ 1.1+ -0.3+ 2.0]/50

= 0.338

Standard deviation :- = [-2.5+ 1.3+ -0.8+ -1.9+ 2.1+ 0.5+ -1.2+ 1.8+ -0.5+ 2.3+ -0.7+ 1.2+ -1.5+ -0.3+ 2.6+ 1.1+ -1.7+ 0.9+ -1.4+ 0.3+ 1.9+ -1.1+ -0.4+ 2.2+ -0.9+ 1.6+ -0.6+ -1.3+ 2.4+ 0.7+ -1.8+ 1.5+ -0.2+ -2.1+ 2.8+ 0.8+ -1.6+ 1.4+ -0.1+ 2.5+ -1.0+ 1.7+ -0.9+ -2.0+ 2.7+ 0.6+ -1.4+ 1.1+ -0.3+ 2.0] – 0.338

= 1.493

Lets calculate the skewness = [n / ((n-1)(n-2))] \* Σ[((returns - mean) / standard deviation) ^ 3]

= (50(50+1(50-2\*Σ[((returns - 0.338) /1.493 ^3))

= 0.323

1. Kurtosis: Calculate the kurtosis of the monthly returns

Kurtosis :- kurtosis is the measures the thickness of the graph tail . basicall y graph tail rate is

Three types od the kurotosis types

the 3 maximum 3 plus tail thatis for the leptokurtic .

lowest3 value tail to platykurotis and

the exjectpt graph 3 value is the l meso kurtosis

formula of the l kurotsis =[n(n+1) / (n-1)(n-2)(n-3)] \* / standard deviation) ^ 4] - [3 \* (n-1)^2 / (n-2)(n-3)]

[50(50+1)/(50-1)(50-2)(50-3))] \* Σ[((returns – 0.338)/1.493)^4]-[3\*(50-2]^2 / (50^2(50-3))]

Kurtosis = 3.288

. 3.2 Interpretation: Based on the Σ[((returns - mean) skewness and kurtosis values+ what can be said about the distribution of returns?

the skewness value of approximately -0.323+ we can say that the distribution is slightly negatively skewed+ meaning it has a longer left tail.

Question :- 2

Question : A research study wants to analyze the income distribution of a population to understand the level of income inequality.

Data: Let's consider the monthly incomes (in thousands of dollars) of a sample of 100 individuals:

Incomes:

2.5+ 4.8+ 3.2+ 2.1+ 4.5+ 2.9+ 2.3+ 3.1+ 4.2+ 3.9+ 2.8+ 4.1+ 2.6+ 2.4+ 4.7+ 3.3+ 2.7+ 3.0+ 4.3+ 3.7+ 2.2+ 3.6+ 4.0+ 2.7+ 3.8+ 3.5+ 3.2+ 4.4+ 2.0+ 3.4+ 3.1+ 2.9+ 4.6+ 3.3+ 2.5+ 4.9+ 2.8+ 3.0+ 4.2+ 3.9+ 2.8+ 4.1+ 2.6+ 2.4+ 4.7+ 3.3+ 2.7+ 3.0+ 4.3+ 3.7+ 2.2+ 3.6+ 4.0+ 2.7+ 3.8+ 3.5+ 3.2+ 4.4+ 2.0+ 3.4+ 3.1+ 2.9+ 4.6+ 3.3+ 2.5+ 4.9+ 2.8+ 3.0+ 4.2+ 3.9+ 2.8+ 4.1+ 2.6+ 2.4+ 4.7+ 3.3+ 2.7+ 3.0+ 4.3+ 3.7+ 2.2+ 3.6+ 4.0+ 2.7+ 3.8+ 3.5+ 3.2+ 4.4+ 2.0+ 3.4+ 3.1+ 2.9+ 4.6+ 3.3+ 2.5+ 4.9

Questions: 1. Skewness: Calculate the skewness of the income distribution.

Skewness = (3\*(mean-median)) / standard deviation =

Find the Skeness :- is the data of the mean+median and std find is the first step

Mean = total of sum of the data / total count of the data

( 2.5+ 4.8+ 3.2+ 2.1+ 4.5+ 2.9+ 2.3+ 3.1+ 4.2+ 3.9+ 2.8+ 4.1+ 2.6+ 2.4+ 4.7+ 3.3+ 2.7+ 3.0+ 4.3+ 3.7+ 2.2+ 3.6+ 4.0+ 2.7+ 3.8+ 3.5+ 3.2+ 4.4+ 2.0+ 3.4+ 3.1+ 2.9+ 4.6+ 3.3+ 2.5+ 4.9+ 2.8+ 3.0+ 4.2+ 3.9+ 2.8+ 4.1+ 2.6+ 2.4+ 4.7+ 3.3+ 2.7+ 3.0+ 4.3+ 3.7+ 2.2+ 3.6+ 4.0+ 2.7+ 3.8+ 3.5+ 3.2+ 4.4+ 2.0+ 3.4+ 3.1+ 2.9+ 4.6+ 3.3+ 2.5+ 4.9+ 2.8+ 3.0+ 4.2+ 3.9+ 2.8+ 4.1+ 2.6+ 2.4+ 4.7+ 3.3+ 2.7+ 3.0+ 4.3+ 3.7+ 2.2+ 3.6+ 4.0+ 2.7+ 3.8+ 3.5+ 3.2+ 4.4+ 2.0+ 3.4+ 3.1+ 2.9+ 4.6+ 3.3+ 2.5+ 4.9)/ 100

= 325.9/ 100

= 3.259

Median = the middle value is the sorted in the ascending order .

2.0+ 2.0+ 2.1+ 2.2+ 2.2+ 2.3+ 2.4+ 2.4+ 2.5+ 2.5+ 2.5+ 2.6+ 2.6+ 2.7+ 2.7+ 2.7+ 2.8+ 2.8+ 2.8+ 2.8+ 2.9+ 2.9+ 2.9+ 3.0+ 3.0+ 3.0+ 3.0+ 3.1+ 3.1+ 3.1+ 3.2+ 3.2+ 3.2+ 3.2+ 3.3+ 3.3+ 3.3+ 3.3+ 3.3+ 3.4+ 3.4+ 3.4+ 3.5+ 3.5+ 3.5+ 3.6+ 3.6+ 3.6+ 3.7+ 3.7+ 3.7+ 3.7+ 3.8+ 3.8+ 3.8+ 3.9+ 3.9+ 3.9+ 3.9+ 4.0+ 4.0+ 4.0+ 4.1+ 4.1+ 4.1+ 4.2+ 4.2+ 4.2+ 4.3+ 4.3+ 4.3+ 4.4+ 4.4+ 4.4+ 4.5+ 4.6+ 4.6+ 4.6+ 4.7+ 4.7+ 4.7+ 4.8+ 4.9+ 4.9+ 4.9

Median = is the all the even number is the median formula is the .

Median =((n/2)+ (n/2+1))

M = (100/2 ) +(100+1/2)

(50th position value) + (51th position value is )

(50th + 51) value is the /2

(2.9 +29)/2

2.9

(50th postion value ) = 2.9

Standard Deviation is the :-

mean = total of sum of the data / total count of the data

(325.9) / 100

3.259

Step :2 Find the Numerator :- mean value ( difference value find the then Diffrence value Square)

(2.5-3.25) ^2 = 0.58281

4.8 - 3.259)^2 = 1.81081

(3.2 - 3.259)^2 = 0.00361

(2.1 - 3.259)^2 = 1.34961

( Continue as the 100 data difference value will be fin and square )

Step3 :- find the Squared differences ( Eccepted mean)

( 0.32534/100)

= 0.621001

Last Step :- take the diffrenced mean itS find the Square roots .

√(Mean of Squared Differences)

√.621001

= 0.78798

Lets Calculate the Skewness :- mean value :- 0.3259

Median value = 3.2

Std = 0.819

Skenwess FOrmulla = Skewness = (3\*(mean-median)) / standard deviation

= (3\*(3.259-3.2)) / 0.819

= 0.215

1. Kurtosis: Calculate the kurtosis of the income distribution.

Lets Calculate the 4th Position of the Kurtosis = kurtosis is the uses the pickedness measures comapared.

Kurtiisis Value generated the graph if the graphs is the

( graph tail right to left = positive kurtosis)

( graph tail left to right = positive kurtosis )

:- kurtosis Formula is the Generated grapth 3 types :-

1. Lepto Kurtosis (grath tailed is the less than 3 )
2. Meso kuritsos ( normal Distriburtion is the data is >3 )
3. Platkurtosis ( graph tail flat )

Kurtosis formula :- (sum of (x- mean)^ 4 ) / (count of the point \* standard Deviation ^ 4 ) - 3

kurtosis = (sum of ( x – 3.259 ) ^ 4) / ( 100 – 0.819 ^ 4 ) -3

kurtosis (26.0235006258) / (100- 0.819) ^ 4) -3

2.907

Skewdness =

Kurtosis value is the = 2.907 is the data graph tailed is the less than 3 that is why kurtosis types is the lepto graph

Question :3 )

A survey was conducted to analyze the satisfaction ratings of customers on a scale of 1 to 5 for a specific product

Data: Let's consider the satisfaction ratings from 200 customers: Ratings

: 4+ 5+ 3+ 4+ 4+ 3+ 2+ 5+ 4+ 3+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 3+ 4+ 3+ 2+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4+ 3+ 4+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4+ 3+ 4+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4

Questions:

1. Skewness: Calculate the skewness of the satisfaction ratings

Skewness formula :- [n / ((n-1)(n-2))] \* Σ[((xi - mean) / standard deviation) ^ 3]

Xi= number of the each data point

Mean = average value of the data ‘

Standard deviation = standard deviation is the use for the mesure the average data is the actual center point to whch frequency far.

Skewness :-

1st step : mean:- mean = total of sum of the data / total count of the data

= : ( 4+ 5+ 3+ 4+ 4+ 3+ 2+ 5+ 4+ 3+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 3+ 4+ 3+ 2+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4+ 3+ 4+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4+ 3+ 4+ 5+ 4+ 2+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 4+ 5+ 3+ 4+ 5+ 4+ 3+ 3+ 4+ 5+ 2+ 3+ 4+ 4+ 3+ 5+ 4 )/100

= 355/100

3.55

2nd Step is the median Find

:- first then all the data in Interpreate in Ascending order .

2+ 2+ 2+ 2+ 2+ 2+ 2+ 2+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 3+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 4+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5+ 5

All the data is the even this data middle value is the find the Median

Median =((n+1/2)

(101/2)

= 50th AND 51st value is the find this data set

3+3/2

= 3

Is that 100 and 101 value position value is the median value

100th value is the =5 .

3rd step :- is the standard Deviation

Standard Deviation is the :-

mean = total of sum of the data / total count of the data

(377) / 100

3.708666

Median = is the all the even number is the median formula is the .

Median =((n/2)+ (n/2+1))

(100/2 )

50 or 51 values

= (4+4 /2 )

= 4

Step :2 Find the Numerator :- mean value ( difference value find the then Diffrence value Square)

(5-3.7) ^2 = 1.69

(4-3.7) ^2 = 0.09

(2-3.7) ^2 = -2.89

(3-3.7) ^2 = 1.69

(4-3.7) ^2 =0.09

( Continue as the 100 data difference value will be fin and square )

Step3 :- find the Squared differences ( Eccepted mean)

( 0.3253434643/100)

=0.03400927

Last Step :- take the diffrenced mean itS find the Square roots .

√(Mean of Squared Differences)

√0.03400927

= 0.184335

Lets Find the Skewness = Skenwess FOrmulla = Skewness = (3\*(mean-median)) / standard deviation

= (3\*(3.70 -4)) / 0.184335

= -4.882415168

2. Kurtosis: Calculate the kurtosis of the satisfaction ratings.

Lets Calculate the 4th Position of the Kurtosis = kurtosis is the uses the pickedness measures comapared.

Kurtiisis Value generated the graph if the graphs is the

( graph tail right to left = positive kurtosis)

( graph tail left to right = positive kurtosis )

:- kurtosis Formula is the Generated grapth 3 types :-

1. Lepto Kurtosis (grath tailed is the less than 3 )
2. Meso kuritsos ( normal Distriburtion is the data is >3 )
3. Platkurtosis ( graph tail flat )

Kurtosis formula :- (sum of (x- mean)^ 4 ) / (count of the point \* standard Deviation ^ 4 ) - 3

= ( sum of (x-3.777) ^4) / (100 \* 3.75 ^ 4) -3

= 0.00964

By answering these questions using measures of skewness and kurtosis+ the survey can assess the skewness and peakedness of the satisfaction ratings+ determine if the ratings are skewed towards positive or negative evaluations+ and understand the distribution characteristics of customer satisfaction.

Skewness= -4.882415168

Kurtosis values = 0.000964

Question = 4

Question : A study wants to analyze the distribution of house prices in a specific city to understand the market trends.

Data:

Let's consider the house prices (in thousands of dollars) for a sample of 150 houses:

House Prices:

280+ 350+ 310+ 270+ 390+ 320+ 290+ 340+ 310+ 380+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290

Questions:

1. Skewness: Calculate the skewness of the house price distribution.

Questions: 1. Skewness: Calculate the skewness of the income distribution.

Skewness = (3\*(mean-median)) / standard deviation =

Find the Skeness :- is the data of the mean+median and std find is the first step

Mean = total of sum of the data / total count of the data

Mean = (280+ 350+ 310+ 270+ 390+ 320+ 290+ 340+ 310+ 380+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290) / 100

= 28+420 / 100

= 284.20

2nd Median value Find this :- 1st all the data is the sorted Ascending order all the value set .

270+ 270+ 270+ 270+ 270+ 270+ 270+ 270+ 270+ 270+ 280+ 280+ 280+ 280+ 280+ 280+ 280+ 280+ 280+ 280+ 290+ 290+ 290+ 290+ 290+ 290+ 290+ 290+ 290+ 290+ 300+ 300+ 300+ 300+ 300+ 300+ 300+ 300+ 300+ 310+ 310+ 310+ 310+ 310+ 310+ 310+ 310+ 310+ 310+ 310+ 320+ 320+ 320+ 320+ 320+ 320+ 320+ 320+ 320+ 320+ 330+ 330+ 330+ 330+ 330+ 330+ 330+ 330+ 330+ 340+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 350+ 370+ 370+ 370+ 370+ 370+ 370+ 370+ 370+ 370+ 380+ 390

Median value = (n/2)

= 50th value and 51st value is the find this sorted List

= (290 +290) /2

= (580/2)

=290

Standard Deviation:- 1st Step is the mean value : -

Mean = total of sum of the data / total count of the data

Mean = (280+ 350+ 310+ 270+ 390+ 320+ 290+ 340+ 310+ 380+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290+ 270+ 350+ 300+ 330+ 370+ 310+ 280+ 320+ 350+ 290) / 100

= 28+420 / 100

= 284.20

( Difffence between mean value and orginal data set . )

(280-284) ^2 = -8

(350-284) ^2 = 4356

(310-284) ^2 = 676

(270-284) ^2 = -196

Last Step :- take the diffrenced mean itS find the Square roots .

79800

Variance = Divide the sum of squared differences by the number of values (N) to get the variance:

Variance = Sum of squared differences / N

= 79800/100

√798

28.25

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lets find the Skewness : -

Mean = 79800

Median = 290

Count of the all the data = 100

Std = 28.25

* Skewness:-

Skewness = (3\*(mean-median)) / standard deviation

= ( 3\* 79800- 290)) / 28.25

= -6.22

1. Kurtosis: Calculate the kurtosis of the house price distribution

Kurtosis: Calculate the kurtosis of the satisfaction ratings.

Lets Calculate the 4th Position of the Kurtosis = kurtosis is the uses the pickedness measures comapared.

Kurtiisis Value generated the graph if the graphs is the

( graph tail right to left = positive kurtosis)

( graph tail left to right = positive kurtosis )

:- kurtosis Formula is the Generated grapth 3 types :-

1. Lepto Kurtosis (grath tailed is the less than 3 )
2. Meso kuritsos ( normal Distriburtion is the data is >3 )
3. Platkurtosis ( graph tail flat )

Mean = 79800

Median = 290

Count of the all the data = 100

Std = 28.25

Kurtosis = (Σ(xi - mean)^4 / N) / (standard deviation)^4

= 79800 - 284.20 )^4 /100) / 28.25 ) ^4

3203 / 28.25

= 113 ^4

= 4.54

. 3. Interpretation: Based on the skewness and kurtosis values+ what can be inferred about the distribution of house prices?

Skewness = -6.22

Kurtosis = 4.54

Is the kurtosis values is the grater than 3 is the platy kurtosis . this graph tailed is the value grater in the right to left direction .

Question :- Question : A company wants to analyze the waiting times of customers at a service center to improve operational efficiency.

Data:

Let's consider the waiting times (in minutes) for a sample of 100 customers: Waiting Times:

12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17+ 22+ 19+ 13+ 16+ 21+ 22+ 17+ 19+ 22+ 18+ 14+ 20+ 19+ 17+ 22+ 18+ 15+ 21+ 20+ 16+ 12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17+ 22+ 19+ 13+ 16+ 21+ 22+ 17+ 19+ 22+ 18+ 14+ 20+ 19+ 17+ 22+ 18+ 15+ 21+ 20+ 16+ 12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17+ 22+ 19+ 13+ 16+ 21+ 22+ 17+ 19+ 22+ 18+ 14+ 20+ 19+ 17+ 22+ 18+ 15+ 21+ 20+ 16+ 12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17

Questions:

1. Skewness: Calculate the skewness of the waiting time distribution.

Skewness = (Σ(xi - mean)^3 / (N \* standard deviation)^3)

Skewness find the Three step devided the

1st mean +Standard deviation + Diffrence beween+ Variance

Mean:-

(12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17+ 22+ 19+ 13+ 16+ 21+ 22+ 17+ 19+ 22+ 18+ 14+ 20+ 19+ 17+ 22+ 18+ 15+ 21+ 20+ 16+ 12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17+ 22+ 19+ 13+ 16+ 21+ 22+ 17+ 19+ 22+ 18+ 14+ 20+ 19+ 17+ 22+ 18+ 15+ 21+ 20+ 16+ 12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17+ 22+ 19+ 13+ 16+ 21+ 22+ 17+ 19+ 22+ 18+ 14+ 20+ 19+ 17+ 22+ 18+ 15+ 21+ 20+ 16+ 12+ 18+ 15+ 22+ 20+ 14+ 16+ 21+ 19+ 17 )/100

= 1812 /100

= 18.12

1. DIFFRence between mean value and old current data set value .

( 12 -18.12) ^4 = -229.220928

(18 – 18.12) ^4 = -0.001728

( 15– 18.12) ^4 =-30.371328

(22– 18.12) ^4=58.41

(20 – 18.12) ^4 = 6.6446

(14 – 18.12) ^4= 69.9344

Continue all the data in mean difference value on quabe. All the diffrnece mean value ia the = 21.164

Variance = variance all the data value is the standard deviation value square root .

√Variance = √0.723944

= 0.851106

Lets caluate skewness :-

Skewness = (sum of cubbed Diffrences / (n \* Standard Deviation ) ^3

= ( -21.164 /(100 \* 0.851106 ) ^ 3 )

= 0.4117

2. Kurtosis : Calculate the kurtosis of the waiting time distribution.

Kurtosis: Calculate the kurtosis of the satisfaction ratings.

Lets Calculate the 4th Position of the Kurtosis = kurtosis is the uses the pickedness measures comapared.

Kurtiisis Value generated the graph if the graphs is the

( graph tail right to left = positive kurtosis)

( graph tail left to right = positive kurtosis )

:- kurtosis Formula is the Generated grapth 3 types :-

1. Lepto Kurtosis (grath tailed is the less than 3 )
2. Meso kuritsos ( normal Distriburtion is the data is >3 )
3. Platkurtosis ( graph tail flat )

Mean -=18.12

QUAbed Answer = 37,374.68364

N = 100

Standard Deviation :- 51.952512

Kurtosis = (Σ(xi - mean)^4 / (N \* standard deviation)^4) – 3

Kurtosis = (Sum of fourth power differences / (N \* standard deviation)^4) – 3

(37,374.68364 / (100 \* 0.51952512 ) ^4)) – 3

(37,374.68364 / 51.952512 ) -3

720.045386 -3

= 717.045386

3. Interpretation: Based on the skewness and kurtosis values+ what can be inferred about the waiting time distribution?

Skewness answer valus is the

Kurtosis value is the 717.045386 kurtosis value is approximately 7.17.045386 . always the kurtosis value is the grater than 3 is the graph tailed is the leptokurtic .

By answering these questions using measures of skewness and kurtosis+ the company can assess the symmetry and tail behavior of the waiting time distribution+ identify any patterns or anomalies in customer waiting times+ and make improvements to streamline the service process and enhance customer satisfaction.