1. mean median mode

data 12,15,12,14,16,14,14,18,20,18

A. mean=12+15+12+14+16+14+14+18+20+18/10

153/10=15.3

median=12,12,14,14,14,15,16,18,18,20 even

| |

median=(14+15)/2

median=29/2

median=14.5

mode 4

2. calculated weighted mean

values=10,20,30,40

weight=1,2,3,4

A. W.M=10\*1+20\*2+30\*3+40\*4/1+2+3+4

=300/10

=30

3. Mean of Grouped Data

calculate mean

class interval:10-20,20-30,30-40,40-50

frequencies:5,10,15,20

A. midpoint =10+15/2=15

=20+30/2=25

=30+40/2=35

=40+50/2=45

class interval=10-20:5\*15=75

=20-30:10\*25=250

=30-40:15\*35=525

=40-50:20\*45=900

sum of products=70+250+525+900=1750

sum of frequencies=5+10+15+20=50

mean=sum of prduct/sum of frequency

=1750/50

=35

4. variance and std deviation

data:4,8,6,5,3,7,9

A. mean=4+8+6+5+3+7+9/7

mean=42/7=6

variance= sigma^2=(xi-x)^2/7

4 -2 4

8 2 4

6 0 0

5 -1 1 ==28/7=4

3 -3 9

7 1 1

9 3 9

std deviation=sqrt(variance)

=2

5.find range & interquartile Range

8,10,15,20,25,30,35,40

A. Range=max-min

=40-8

=32

median=(20+25)/2=45/2=22.5

Q1 is median of lower half=8,10,15,20

Q1=(10+15)/2

=25/2

=12.5

Q3 is median of upper half=25,30,35,40

Q3=(30+35)/2

=65/2

=32.5

IQR=Q3-Q1

=32.5-12.5

=20

6 .variance and std deviation

class interval:0-10,10-20,20-30,30-40

frequency:4,6,8,2

A. midpoint 0-10=0+10/2=5

10-20=10+20/2=15

20-30=20+30/2=25

30-40=30+40/2=35

class interval 0-10:5\*4=20

10-20:15\*6=90

20-30:25\*8=200

30-40:35\*2=70

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380

sum of product=20+90+200+70=380

sum of frequency=4+6+8+2=20

mean=380/20=19

class interval 0-10:(5-19)^2\*4 = 14^2\*4=196\*4=784

class interval 10-20:(15-19)^2\*6 =4^2\*6=16\*6=96

class interval 20-30:(25-19)^2\*8 =6^2\*8=36\*8=288

class interval 30-40:(35-19)^2\*2 =16^2\*2=256\*2=512

784+96+288+512=1680

variance= sum of squared deviation/total frequency

=1680/20

=84

standard deviation=sqrt(variance)

=sqrt(84)

=9.17

7. coefficient of variation

mean=25 and std deviation=5

A. coefficient of variation=(S.D/Mean)\*100

=(5/25)\*100

=0.2\*100

=20%

8. Compare dispersion of two data sets using S.D

set 1: 10,12,14,16,18

set 2: 20,22,24,26,28

A. For set 1: 10,12,14,16,18

mean=(10+12+14+16+18)/5

= 70/5

=14

deviation mean Squared deviation

=(10-14)=-4 =-4^2=16

=(12-14)=-2 =-2^2= 4

=(14-14)= 0 = 0^2= 0

=(16-14)= 2 = 2^2= 4

=(18-14)= 4 = 4^2=16

Variance=(16+4+0+4+16)/5

=40/5

=8

S.D=SQRT(variance)

=SQRT(8)

=2.8

B.

For set 2: 20,22,24,26,28

mean=(20+22+24+26+28)/5

=( 120)/5

=24

deviation mean Squared deviation

=(20-24)=-4 =-4^2=16

=(22-24)=-2 =-2^2= 4

=(24-24)= 0 = 0^2= 0

=(26-24)= 2 = 2^2= 4

=(28-24)= 4 = 4^2=16

Variance=(16+4+0+4+16)/5

=40/5

=8

S.D=SQRT(variance)

=SQRT(8)

=2.8

both have same S.D ,it shows both have equal level of dispersion and variability.

9. Outliers and Box Plot?

Identify outliers using IQR method and prepare box plot

Data:5,7,8,10,15,20,30,50

10. Explain with real example where central tendency and measure of dispersion are used to interpret data and give example and with calculations?

A. A Class Teacher collected exam marks of 10 students to check their maths performance

student marks

1 70

2 80

3 70

4 75

5 85

central tendency

mean=(70+80+70+75+85)/5

= 380/5

=76

median=70,70,75,80,85

median=75

Mode=70 is twice

Measures of Dispersion

Range=max-min

=85-70

=15

Marks Deviation Sqr Deviation

70 -6 36

80 4 16

70 -6 36

75 -1 1

85 -9 81

Variance=(36+16+36+0+81)/5

=33.8

S.D=SQRT(variance)

=SQRT(33.8)

=5.81

This shows that avg student scored 76, median(75) value is very close to mean and range is 15 point which shows that highest score is 15 points higher than lower score.

This shows that students performed well with variation in their scores.