

Statistics

Lecture 6



Feb 19-8:47 AM

I randomly selected 25 exams, here are the

Scores:

54 59 62 65 68
 70 72 75 75 75
 78 81 83 86 86
 86 88 89 90 92
 93 95 99 100 100

1) $n=25$

2) Range = $100 - 54 = 46$

3) Midrange = $\frac{100 + 54}{2} = 77$

4) Mode 75 & 86

5) Estimate $S \approx \frac{\text{Range}}{4} = \frac{46}{4} = 11.5$

6) Make STEM plot
 "Data must be sorted"

```

5 | 49
6 | 258
7 | 025558
8 | 1366689
9 | 02359
10 | 00
    
```

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$\begin{array}{r} 5 49 \\ 6 258 \\ 7 025558 \\ 8 1366689 \\ 9 02359 \\ 10 00 \end{array}$	<p>1) Find P_{20}</p> $L = \frac{20}{100} \cdot 25 = 5$ <p style="text-align: center;">↑ whole #</p> $P_{20} = \frac{5^{\text{th}} + 6^{\text{th}}}{2} = \frac{68 + 70}{2} = \boxed{69}$ <div style="text-align: center;"> $\frac{20\% \quad \quad 80\%}{P_{20} = 69}$ </div>
<p>2) Find P_{78}</p> $L = \frac{78}{100} \cdot 25 = 19.5$ <p style="text-align: center;">↑ Decimal</p> $L = 20$	<p>$P_{78} = 20^{\text{th}} \text{ element}$</p> $= 92$ <div style="text-align: center;"> $\frac{78\% \quad \quad 22\%}{P_{78} = 92}$ </div>
<p>3) Find K such that $P_K = 80$</p> <p style="text-align: center;">Below</p> $K = \frac{B}{n} \cdot 100 = \frac{11}{25} \cdot 100 = 44$ <p style="text-align: center;">Round to whole %</p>	<p>$P_{44} = 80$</p> <div style="text-align: center;"> $\frac{44\% \quad \quad 56\%}{P_{44} = 80}$ </div>

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TI instructions

- 1) Clear All lists. 2nd + 4:ClearAllLists Enter
- 2) clear Screen clear
- 3) Turn the Diagnostic key on.

2nd 0 ↓ ↓ ↓ --- ↓ ▶DiagnosticOn Enter
Enter
- 4) Reset all lists

STAT Edit Enter
5:SetupEditor

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Store the following in List 1:

27	32	18	25	19			
24	33	40	20	35			
38	28						

STAT Edit L1
1:Edit 27
32
18
...
28

Let's quit
end MODE

Let's view L1
end 1 Enter
{ 27 32 18 25 19 ... 25 }
← ← ← → → →

Let's sort L1, then view it.
STAT Edit end 1 Enter
2:SortA
end 1 Enter { 18 19 20 24 25 }
← ← ← → → →

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Find \bar{x} & S
Mean Standard Deviation

STAT → CALC
1:1-Var Stats

$\bar{x} = 28.25$
 $S = S_x = 7.412$
 $n = 12$
Min = 18
 $Q_1 = 22$
Med = 27.5
 $Q_3 = 34$
Max = 40

2nd 1
Menu List: L1
FreqList: clear Enter
Calculate

No Menu L1 Enter

Find S^2 in Reduced Fraction.
VARS 5: Statistics 3: Sx
 x^2 Math 1: Frac
Enter $S^2 = \frac{2417}{44}$

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Min = 18

$Q_1 = 22$

Med = 27.5

$Q_3 = 34$

Max = 40

5-Number Summary

Summary

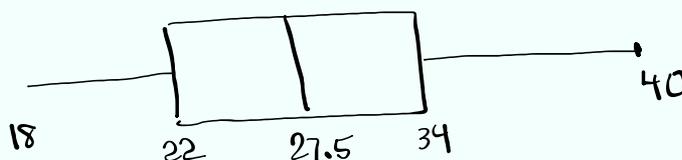
$IQR = Q_3 - Q_1 = 34 - 22 = 12$

Upper Fence = $Q_3 + 1.5(IQR)$
 $= 34 + 1.5(12) = 52$

Lower Fence = $Q_1 - 1.5(IQR)$
 $= 22 - 1.5(12) = 4$

Discuss outliers None

Draw Box Plot



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Complete the chart below

class limits	class BNDPS	class MP	class F	Cum. F	Rel. F	%F
18 - 30	17.5 - 30.5	24	5	5	.25	25%
31 - 43	30.5 - 43.5	37	12	17	.60	60%
44 - 56	43.5 - 56.5	50	3	20	.15	15%

3 classes, CW = 13, $MP = \frac{18+30}{2} = \frac{48}{2} = 24$, $n = 20$
 $Rel F = \frac{f}{n} = \frac{5}{20}$

How to find \bar{x} & S of a grouped data:

1) clear All lists. [end] + [4:clear all lists] [Enter]

2) class MP → L1
 class F → L2

STAT	Edit	L1	L2
	[1:Edit]	24	5
		37	12
		50	3

3) [STAT] → CALC

1:1-Var Stats

$\bar{x} = 35.7$
 $S = 8.329$
 $n = 20$

Menu
 List: L1
 FreqList: L2
 Calculate [Enter]

No Menu
 L1, L2
 [1]
 [Enter]

Find S^2 in reduced fraction.

[VAR] [5: Statistics] [3: Sx] [χ^2] [Math] [1: Frac] [Enter]
 $S^2 = \frac{6591}{95}$

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Working with ordered Pairs:
(x, y)

x	y	x ²	y ²	xy
1	3	1	9	3
2	5	4	25	10
3	6	9	36	18
4	6	16	36	24

1) 4 Rows → n=4
x → L1, y → L2
[2nd] [4:] [Enter]
go to L1, enter x-values
→ enter y-values in L2

L1	L2
1	3
2	5
3	6
4	6

[STAT] → CALC
[2: 2-Var Stats]
Menu No Menu
xlist: L1 L1, L2
Ylist: L2
freqlist: [Clear] [Enter]
[Calculate]

Σx=10 Σy=20
Σx²=30 Σy²=106
n=4 Σxy=55

Scatter Plot

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x	y
Study time	QZ Score
2	8
3	9
4	9
1	5
3	10

Scatter Plot

[STAT] → CALC
[2: 2-Var Stats]
x → L1 No Menu
y → L2 L1, L2
xlist: L1
Ylist: L2
freqlist: [Clear] [Enter]
[Calculate]

Σx=13 Σy=41
Σx²=39 Σy²=351
n=5 Σxy=114

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STAT → CALC ↓
 ↓
8: LinReg(a+bx)
Enter
 Menu No Menu
 Xlist: L1 L1, L2
 Ylist: L2 7
Enter
clear
Calculate $a = 4.5$
 If r & r^2 Missing:
2nd 0 ↓ ↓ ↓ ... ↓ Diagnostic On $b = 1.423$
Enter $r^2 = .712$
Enter $r = .844$

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QZ Score	Exam Score
7	82
8	90
10	95
6	75
8	85

Exam Scores

STAT → CALC
 ↓
8: LinReg(a+bx)
 Xlist: L1 L1, L2
 Ylist: L2 Enter
clear
Calculate

QZ Scores → X → L1
 Exam Scores → Y → L2
 $a = 46.932 \approx 47$
 $b = 4.932 \approx 5$
 $r^2 = .918$
 $r = .958$

VAR 5: Statistics 2: \bar{x} Enter $7.8 \approx 8$
VAR 5: Statistics 5: \bar{y} Enter $85.4 \approx 85$

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