

Math 142: Wednesday, September 11th, Day 8 Notes

Agenda for Wednesday, Sep 11th 2024

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Reminders

- ! Group Quiz 2 today on Chapter 2 (you can use your won notes)
- ! Exam 1 on Wednesday Sept 18th
- First **Excel Homework** due today in Canvas (Excel file upload)

Recall:

mean
population mean = μ
sample mean = $\bar{x}$
median $\rightarrow$ middle

Example 3. Find the median of the data set:

**Grade Point Averages of
Students in a Class**

0	8	Key: $0 8 = 0.8$
1	5 6 8	
2	1 3 4 5	
3	0 9	
4	0 0	

Data:

Median:

Another measure of central tendency is **mode**.

The **mode** is the most frequent value(s) in the data set.

Example 4. Find the mode(s).

**Weights (in pounds) of
Carry-On Luggage on a Plane**

0	6 7	Key: $3 2 = 32$
1	2 5 8 9	
2	0 4 4 4 5 8 9	
3	2 2 3 5 5 5 6 8 9	
4	0 1 2 7 8	
5	1	

We have 2 modes

24 and 35.

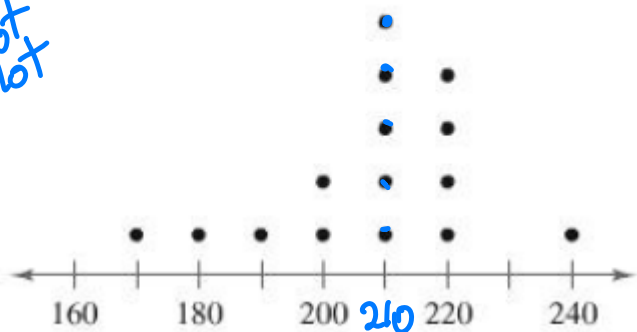
Bimodal data set.

Data values: 6, 7, 12, 15, 18, 19, 20, 24, 24, 24, 25, 28, 29, 32, 32, 33, 35, 35, 35, 36, 38, 39, 40, 41, 42, 47, 48, 51

Example 5. Find the mode(s).

**Prices (in dollars per night) of
Hotel Rooms in a City**

dot
plot



The mode is 210.

Unimodal data set.

Example 6. Here are the test scores of 10 students: 68, 72, 77, 79, 81, 82, 85, 88, 90, 94. Find the mode(s).

no mode.

ex: 10, 10, 25, 28, 31, 31.

Calculator Steps to find the mean and median of a data set:

1. Enter data in L1 (Stat $\rightarrow$ Edit)
2. Stat | Calc | 1 Var-Stats
3. $\left\{ \begin{array}{l} \bar{x} \text{ mean} = 207.3 \\ \text{median} = 210 \\ \vdots \end{array} \right.$

Midrange

not to be confused with range (highest - lowest)

$$\text{Midrange} = \frac{\text{highest} + \text{lowest}}{2}$$

Example 7. Find the midrange of the weights of Carry-On Luggage on a plane above.

$$\text{midrange} = \frac{51 + 6}{2} = \frac{57}{2} = 28.5 \text{ lbs}$$

$$\text{midrange}_{\text{Hotels}} = \frac{170 + 240}{2} = 205 \$$$

Mean of a Grouped Frequency Distribution

When only grouped data is available, we do not know the individual data values so we cannot compute an exact mean for the data set. However, we can still estimate the sample mean by from the frequency table.

Example 8. Find the best estimate of the mean fuel economy for the 40 small cars.

Mid	MPG	Frequency
27.5	24 - 31	12
35.5	32 - 39	15
43.5	40 - 47	8
51.5	48 - 55	4
59.5	56 - 63	1

↓
L1

$$\frac{24 + 31}{2} = \text{midpoint of class 1}$$

↪ in L2

How to find estimate of mean

1) Find midpoints of each class and enter them in L1.

2) Put the frequency of each class in L2

3) Stat → Calc 1 Var Stats
List: L1
Freq: L2

Calculate

$\bar{x} = 26.9$
is the
estimated for
mean

Weighted mean: when certain data values are worth more (weigh more) than others.

Example 1. Your grade in this class is calculated as weighted mean.

Grade Distribution	Scores
3 In Class Exams 45% .45	80
Online Canvas Homework 20% .2	100
Excel Assignments 10% .1	100
In class group activities 10% .1	100
Final exam 15% .15	50

weights
in L2

in List 1

Section 3.2 Measures of variation

In some data sets, the data values are concentrated closely near the mean; in other data sets, the data values are more widely spread out from the mean. We will discuss three measures of variation: the range, the standard deviation, and the variance.

Range: