

IM2 Problem Set 3.1 - Measures of Central Tendency

BIG PICTURE of this UNIT:	<ul style="list-style-type: none">• How do we analyze and then make conclusions from a data set? (Math)• How do I present my data and the outcomes of my analysis? (Math)• How do I use data & statistics to make decisions?• How do I decide on the validity/reliability of my data? Of my analysis? Of my conclusions? Of my decision?
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Part 1 - Skills Review

1. Here are the weights of 7 students in class (measured in pounds): 150, 160, 173, 155, 160, 175, 170. Calculate the mean, median, mode and range of student weights.

2. Samuel is trying to determine the average height of high school male students. Because he is on the basketball team, he uses the heights of the 14 players on the team, which are given below in inches.

69, 70, 72, 72, 74, 74, 74, 75, 76, 76, 76, 77, 77, 82

- Calculate the mean, median, mode and range for this data set. Round any non-integer answers to the nearest tenth.
 - Is the data set above a fair sample to use to determine the average height of high school male students? Explain your answer.
3. The high temperatures for a 7-day week during December in Chicago were:

29°, 31°, 28°, 32°, 29°, 27°, and 55°.

- Find the mean high temperature for the week.
- In this example, is this mean temperature a good representation of the data?
- Find the median temperature for Chicago during this week.
- Which measure of central tendency is a better indicator of the “central tendency” of temperatures in Chicago this week.

Part 2 - Application Problems with Measures of Central Tendency

1. Students in Mr. Ramirez's statistics class were trying to determine if people speed along a certain section of roadway. They collected speeds of 20 vehicles, as displayed in the table below:

Speed (mph)	Number of Cars
29	1
33	2
34	4
35	5
36	3
38	2
39	2
54	1

- Find the mean, median, and mode for this data set
- The speed limit along this part of the highway is 35 mph. Based on your results from part (a), is it fair to make the conclusion that the average driver does speed on this roadway?

2. Mr Rawlings surveyed his IM2 class about how many pets they had at home. Here are the results of that survey. Determine the mean and median number of pets owned by this students in this class.

Number of Pets	Number of Students
0	2
1	7
2	3
3	1
4	2

3. The stem and leaf plot represents the scores on the Chapter 5 test in Mrs. Jones' geometry class. Find the mean, median, mode and range of scores.

Geometry Test Scores	
Stem	Leaf
5	6 8 9
6	1 6 9
7	4 5 7 7 9 9
8	2 4 6 7 7 8 8 9
9	1 3 3 4 4 5 5 5 7
10	0 0

4. Here are the results of the Trig Unit Quiz given last week. Determine the mean, median and modal grades.

stem	leaf
5	6
6	7, 7, 9
7	2, 4, 7, 7, 8
8	1, 2, 2, 3, 4, 8
9	0, 2, 3, 4

Key: 5 | 6 = 56%

5. The table shows the weights of boxes received at Greco's Coffee Shop.

- Estimate the mean weight of the boxes.
- Determine the modal interval of weights of boxes.
- Prepare a frequency histogram for this data set.
- How probable is it that the next box coming into Greco's has a weight between 4 - 8 kg?

Weight of box (w kg)	Frequency
$0 < w \leq 4$	11
$4 < w \leq 8$	16
$8 < w \leq 12$	29
$12 < w \leq 16$	26
$16 < w \leq 20$	20

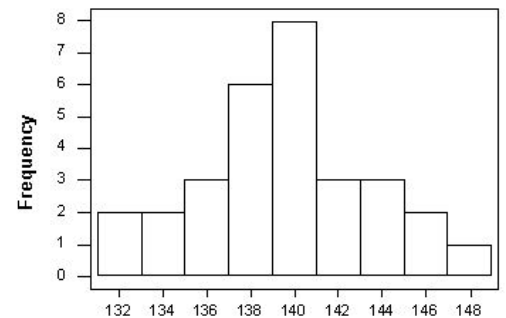
6. Calculate an estimate for the mean weight for students in our IM3 classes.

- Determine the modal interval of the weight of a “typical” IM3 student in our CAC classes.
- Estimate the mean weight of the students.
- Prepare a frequency histogram of the data set
- How probable is it that an IM3 student weighs between 60 - 70 kg?

Weight, w, Kg	Frequency
$40 < w \leq 50$	2
$50 < w \leq 60$	15
$60 < w \leq 70$	18
$70 < w \leq 80$	10
$80 < w \leq 90$	2

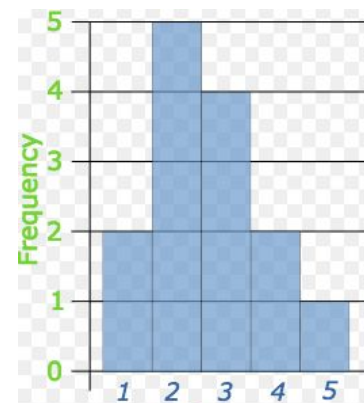
7. Here is a frequency histogram showing the weights of the members of the CA wrestling team.

- Prepare a frequency table from the graph.
- Determine the mean, median and mode of the the data set.
- Determine the interquartile range of the data set.
- Prepare a box and whisker plot.



8. Mr. S. keeps track of his students homework completion for his IM2 class. He collects the data for 5 consecutive classes and counts the number of HW COMPLETIONS and then records the scores in Skyward. So on the histogram shown, the x -axis is the number of HW completions by students in his class in the 5 lessons between Nov 1 and Nov 11.

- Determine the mean of this data set.
- How probable is it that a randomly selected student has 1 homework incompleteness?



9. Determine the median of the data set, for which you have the following information: You know that 12 of the 29 measurements are below 20 cm and you know that 13 of the measurements are above 21 cm. The other 4 measurements are known to be 20.1 cm, 20.4 cm, 20.7 cm and 20.9 cm.

10. (EXTENSION Q) Eight sample values are 6, a , 7, a , 4, b , 6 and 8, where a and b are single digit numbers and the mean is 7.

- Show that a and b have two possible solutions.
- If there is a single mode, what is the median?