

**Unit 1 - Summarizing Data**  
**Homework #1 (Unit 1 – Summarizing Data)**

**Due Date: Monday September 18, 2017**  
**Last submission date for credit: Monday September 25, 2017**

*Note to Class 2017*

*Dear class,*

*My approach to homeworks is to provide the solutions up front. I do this because my goal I providing homework exercises is to offer you a learning experience. As opposed to a grading experience. Believe it or not, this has worked well for over 15 years.*

*My suggestion is that you try each exercise on your own first. When you get stuck, by all means consult the solutions. Then, when submit your work to Blackboard Learn, tell me how it went! This can be as brief as “Just fine!” or as detailed as “I tried to do #4 but I just didn’t understand what you wanted; please help”.*

*As for grading, you will receive a grade of 100 for attempting every exercise. I am not the least bit interested in monitoring your work to see if it is yours or mine. If you submit a copy of my work, that is your choice. Obviously, I hope that your interest in learning will incline you to give it a shot!*

*Cheers.*

1. **This exercise gives you practice with the ideas of Unit 1, Section 3, “Variables and Types of Data”.** For each of the following variables indicate whether it is quantitative or qualitative and specify the measurement scale that is employed when taking measurements on each: (source: Daniel, page 12, problem #6 – note: *You do NOT need to buy this book.*)
  - a) Class standing of members of this class relative to each other
  - b) Admitting diagnosis of patients admitted to a mental health clinic
  - c) Weights of babies born in a hospital during a year
  - d) Gender of babies born in a hospital during a year
  - e) Range of motion of elbow joint of students enrolled in a university health sciences curriculum
  - f) Under-arm temperature of day-old infants born in a hospital

2. **This exercise also gives you practice with the ideas of Unit 1, Sections 7 (“Summaries for Qualitative Data”)** Data were recorded on the age in years and height in cm of 20 high school students in a classroom.

Females		Males	
Age	Height	Age	Height
15	170	15	185
15	154	16	183
16	160	16	174
15	159	15	183
15	156	15	173
15	153	15	173
16	166	15	178
16	163	14	167
15	167	15	177
15	151		
16	171		

**By hand** create a frequency table for age, with columns for frequency, relative frequency, cumulative frequency, and cumulative relative frequency.

3. **This exercise gives you practice with the ideas of Unit 1, Section 4, “The Summation Notation.”** Let  $x_1=3$ ,  $x_2=1$ ,  $x_3=4$ , and  $x_4=6$

3a. Express the following sum in sigma notation and evaluate numerically.

$$(x_1 + x_2 + x_3 + x_4)^2$$

3b. Express the following sum in sigma notation and evaluate numerically.

$$x_1^2 + x_2^2 + x_3^2 + x_4^2$$

3c. Evaluate the following numerically.

$$\sum (X_i - 1)^2 \text{ for } i=1 \dots 4.$$

3d. Evaluate the following numerically.

$$\sum 3X_i \text{ for } i=1 \dots 4.$$

4. **This exercise gives you practice with the ideas of Unit 1, Sections 5 & 6, “Numerical Summaries for Quantitative Data”**

The following are behavioral ratings as measured by the Zang Anxiety Scale (ZAS) for 26 persons with a diagnosis of panic disorder:

53	51	46	45	40	35
59	51	45	60	35	
45	38	53	43	31	
36	40	41	41	38	
69	41	46	38	36	

4a. Compute the mean, median, mode, range, variance, and standard deviation, and the 25th and 75th percentiles.

4b. The following are behavioral ratings as measured by the Zang Anxiety Scale (ZAS) for 21 healthy controls:

26	26	25	25	25
28	26	26	25	
34	30	31	28	
26	34	25	25	
25	28	25	25	

Compute the mean, median, mode, range, variance, and standard deviation, and the 25th and 75th percentiles.

5. **This exercise gives you practice working with grouped data. See notes for Unit 1, Sections 5, “The Mean of Grouped Data”.**

The following table shows the age distribution of cases of a certain disease reported during a year in a particular state.

Age	Number of Cases
5-14	5
15-24	10
25-34	20
35-44	22
45-54	13
55-64	5
TOTAL	75

- 5a. Construct a frequency table with columns for class endpoints, class midpoint, frequency, relative frequency, cumulative frequency, and cumulative relative frequency.
- 5b. Estimate the values of the mean, median, variance, and standard deviation. Tip - Use the midpoints of each age interval as your values and use number of cases as their frequencies. For example, the value 10 has an estimated frequency of 5, the value 20 has an estimated frequency of 10, and so on.