

RECITATION  
DESCRIPTIVE STATISTICS

First:

Collect homework due today.  
Handout homework solutions.

In this recitation, you may choose to:

Review one or more homework problems, as needed.  
Explain difficult concepts from the lecture and do some of the problems in this set of notes.

For each of the following problems, we can compute:

mean	range
median	interquartile range
mode	variance
quartiles	standard
deviation	

Pick one problem to convert data to Z-scores

1. EXERCISE:  $X = \#$  minutes waiting for bus  
 $X$   
0 5 10 4 8 6 9 0 2 6

2. EXERCISE:  $X =$  hours to complete task  
 $X$   
6 4 10 4 7 5 9 11

3. EXERCISE:  $X = \#$  cups of coffee students drink in a day  
 $X$   
10 6 9 7 8 0 0 4 5

4. EXERCISE:  $X = \#$  minutes to complete a job  
 $X$  ( $n=20$ )  
10 16 15 11 12 8 8 7 6 5 9 4 5 13 14 10 15 10 12 10

minutes  
 $X =$  waiting for bus

$X$	$\bar{X}$	$(X - \bar{X})$	$(X - \bar{X})^2$
0	5	-5	25
5	5	0	0
10	5	5	25
4	5	-1	1
8	:	3	9
6	:	1	1
9	:	4	16
0	:	-5	25
2	:	-3	9
6	5	1	1
		<hr/>	<hr/>
		0	112

$$s^2 = \frac{112}{9} = 12.44$$

$$s = 3.53 \text{ minutes}$$

$X =$  hours to complete task

$X$	$\bar{X}$	$(X - \bar{X})$	$(X - \bar{X})^2$
6	7	-1	1
4	7	-3	9
10	7	3	9
4	7	-3	9
7	7	0	0
5	7	-2	4
9	7	2	4
11	7	4	16
		<hr/>	<hr/>
		0	52.0

$$s^2 = \frac{52}{7} = 7.43 \text{ hours}$$

$$s = 2.73 \text{ hours}$$

$X = \# \text{ cups coffee / day}$

$n = 9$

$X$	$\bar{X}$	$(X - \bar{X})$	$(X - \bar{X})^2$
10	5.4	4.6	21.16
6	5.4	.6	.36
9	$\vdots$	3.6	12.96
7	$\vdots$	1.6	2.56
8		2.6	6.76
0		-5.4	29.16
0		-5.4	29.16
4		-1.4	1.96
5		-.4	.16
<hr/> 49		<hr/> 0	<hr/> 104.24

$$\bar{X} = 5.4$$

$$s^2 = \frac{104.24}{8} = 13.03$$

$$s = \sqrt{13.03} = 3.6$$

(Example)

Time to do job (minutes)

$n=20$

10	16	15	11	12
8	8	7	6	5
9	4	5	13	14
10	15	10	12	10

4 5 5 6 7 8 8 9 10 10 | 10 10 11 12 12 13 14 15 15 16

$$\bar{X} = \frac{200}{20} = 10$$

$$Q_1 = 7.5 \text{ Min}$$

10

$$\text{Median} = 10 \text{ Min}$$

7.5

12.5

$$S^2 = 12.63 = \frac{240}{19}$$

$$Q_3 = 12.5 \text{ Min}$$

4

16

$$S = 3.55$$

$$4 \rightarrow \frac{4-10}{3.55} = -1.69$$

$$16 \rightarrow \frac{16-10}{3.55} = +1.69$$

$$\sum(X-\bar{X})^2 = \sum X^2 - \frac{(\sum X)^2}{n} = 2240 - \frac{(200)^2}{20} = 240$$