

Exercises 3-1

Problem (1):

(1,a)

3.57	
3.64	
3.64	
3.65	
3.66	
3.67	
3.67	
3.68	
3.7	Mode
3.7	
3.7	
3.73	
3.73	Median
3.74	Mode
3.74	
3.74	
3.75	
3.76	
3.77	
3.78	
3.78	
3.8	
3.8	
3.83	
3.86	
93.09	Total
3.7236	Mean

$$\bar{X} = \frac{\sum X}{n} = \frac{93.09}{25} = 3.724$$

(1,b) Median= 3.73

(1,c) Mode= 3.74 and 3.70

(1,d) MidRange= (3.86 + 3.57)/ 2 = 3.715

Problem (13):

Class		Frequency	X	FX	
2.48	7.48	7	4.98	34.86	
7.49	12.49	3	9.99	29.97	
12.5	17.5	1	15	15	
17.51	22.51	7	20.01	140.07	
22.52	27.52	5	25.02	125.1	
27.53	32.53	5	30.03	150.15	
		28		495.15	Total

$$\bar{X} = \frac{\sum fX}{n} = \frac{495.15}{28} = 17.68$$

Exercises 3-2**Problem (11):**

No	Houston		Pittsburgh		
	X	X ²	X	X ²	
1	75	5625	64	4096	
2	71	5041	54	2916	
3	64	4096	40	1600	
4	56	3136	32	1024	
5	53	2809	46	2116	
6	55	3025	44	1936	
7	47	2209	42	1764	
8	55	3025	41	1681	
9	52	2704	40	1600	
10	50	2500	40	1600	
11	50	2500	34	1156	
12	50	2500	32	1024	
13	47	2209	30	900	
Total	725	41379	539	23413	Total

Houston:

$$s^2 = \frac{\sum x^2 - (\sum x)^2/n}{n-1}$$

$$s^2 = \frac{\sum 41379 - (\sum 725)^2/13}{13 - 1} = 78.86$$

$$s = \sqrt{78.86} = 8.88$$

Pittsburgh:

$$s^2 = \frac{\sum x^2 - (\sum x)^2/n}{n-1}$$

$$s^2 = \frac{\sum 23413 - (\sum 539)^2/13}{13 - 1} = 88.77$$

$$s = \sqrt{88.77} = 9.42$$

Pittsburgh set of data is more variable than that of Houston.

Problem (20):

Class boundaries		f	x	fx	fx ²	
7.5	12.5	3	10	30	300	
12.5	17.5	5	15	75	1125	
17.5	22.5	15	20	300	6000	
22.5	27.5	5	25	125	3125	
27.5	32.5	2	30	60	1800	
		30		590	12350	Total

$$s^2 = \frac{\sum fx^2 - (\sum fx)^2/n}{n-1}$$

$$s^2 = \frac{\sum 12350 - (\sum 590)^2/30}{30 - 1} = 25.75$$

$$s = \sqrt{25.75} = 5.07$$

Exercises 3-3

Problem (11):

$$Z = \frac{x - \mu}{\sigma}$$

$$Z = \frac{87 - 84}{4} = 0.75$$

$$Z = \frac{79 - 84}{4} = -1.25$$

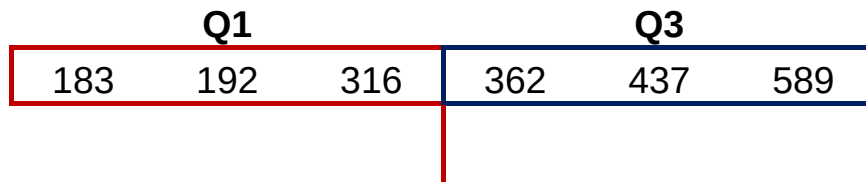
$$Z = \frac{93 - 84}{4} = 2.25$$

$$Z = \frac{76 - 84}{4} = -2$$

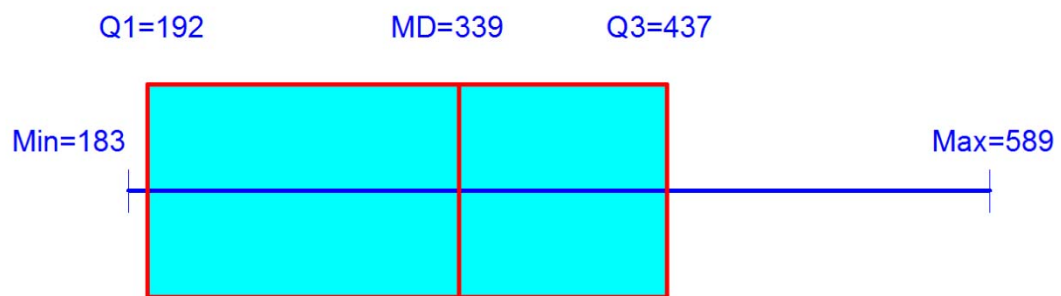
$$Z = \frac{82 - 84}{4} = -0.5$$

Exercises 3-4

Problem (3):



$$MD = (316 + 362) / 2 = 339$$



Box Plot