

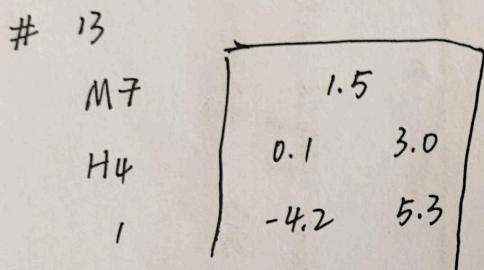
Quiz 2
SDSC 5002

1. Draw a boxplot by hand writing for the following set of data

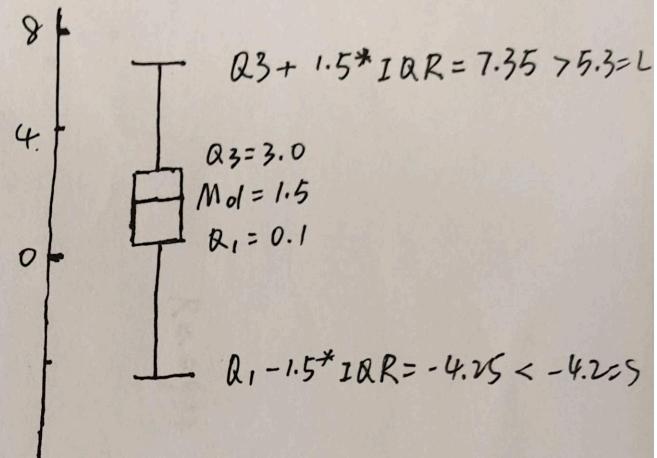
$$1.8, 0.3, 3.0, 1.5, 5.3, -1.7, 0.1, 4.3, -0.4, 5.0, 1.2, -4.2, 2.4$$

first step (refrange) from small to big.

H M H L
 1.5 -4.2 -1.7 -0.4 0.1 0.3 1.2 1.5 1.8 2.4 3.0 4.3 5.0 5.3



$$\text{Compute } IQR = 3.0 - 0.1 = 2.9$$



2.

X	1	1	2	3	6	8	11	11	13	14
Y	4	3	9	5	8	12	13	17	21	17

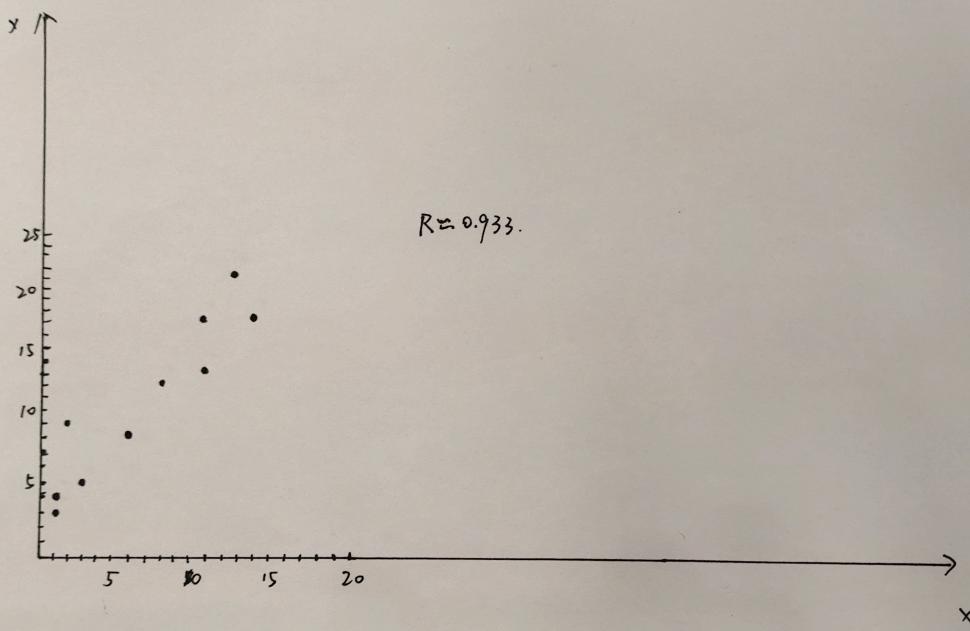
$$\bar{x} = \frac{1+1+2+3+6+8+11+11+13+14}{10} = \frac{7}{10} = 7 \quad \bar{y} = \frac{4+3+9+5+8+12+13+17+21+17}{10} = \frac{99}{10} = 9.9$$

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}} = \frac{(1-7)(4-9.9) + (1-7)(3-9.9) + (2-7)(9-9.9) + (3-7)(5-9.9) + (6-7)(8-9.9)}{\sqrt{[(1-7)^2 + (4-7)^2 + (2-7)^2 + (3-7)^2 + (6-7)^2 + (8-7)^2 + (11-7)^2 + (11-7)^2 + (11-7)^2 + (14-7)^2] \cdot [(4-9.9)^2 + (3-9.9)^2 + (9-9.9)^2 + (5-9.9)^2 + (8-9.9)^2 + (12-9.9)^2 + (13-9.9)^2 + (17-9.9)^2 + (21-9.9)^2 + (17-9.9)^2]}}$$

$$= \frac{(8-7)(12-9.9) + (11-7)(13-9.9) + (11-7)(17-9.9) + (13-7)(21-9.9) + (14-7)(17-9.9)}{\sqrt{[(4-9.9)^2 + (3-9.9)^2 + (9-9.9)^2 + (5-9.9)^2 + (8-9.9)^2 + (12-9.9)^2 + (13-9.9)^2 + (17-9.9)^2 + (21-9.9)^2 + (17-9.9)^2]}}$$

$x-\bar{x}$	-6	-6	-5	-4	-1	1	4	4	6	7	$\sum(x-\bar{x})^2$	232
$y-\bar{y}$	-6.9	-7.9	-1.9	-5.9	-2.9	1.1	2.1	6.1	10.1	6.1	$\sum(y-\bar{y})^2$	338.9
$\frac{(x-\bar{x})(y-\bar{y})}{(y-\bar{y})}$	41.4	47.4	9.5	23.6	2.9	1.1	8.4	24.4	60.6	42.7	$\frac{\sum(x-\bar{x})^2}{\sum(y-\bar{y})^2}$	280.4

$$r = \frac{41.4 + 47.4 + 9.5 + 23.6 + 2.9 + 1.1 + 8.4 + 24.4 + 60.6 + 42.7}{\sqrt{338.9 \times 232}} = \frac{201.6}{\sqrt{78624.8}} \approx 0.933$$



X and y are highly linearly associate as the scatter plot shown ~~and~~
and more importantly the Pearson correlation coefficient > 0.9 .