Second Homework for "101"

1) To find value of x, when the $\bar{x}$ of data equal 63 use formula of mean for n odd.

$$\bar{x} = \frac{x_{\frac{n}{2}} + x_{\frac{n}{2}+1}}{2} \rightarrow = \frac{x_{\frac{n}{2}} + x_{\frac{n}{2}+1}}{2} \rightarrow = \frac{x_n + x_n}{2} \rightarrow \frac{x+(x+2)}{2} \rightarrow = 63$$

$\rightarrow x + (x+2) = 126 \rightarrow 2x = 126-2 \rightarrow 2x = 124 \rightarrow$ **x = 62**

2) a. Mode b. Median c. Median d. Mean

3) a. IQR b. IQR c. SI d. RI

4)

	Data set "X"	Data set "Y"
Mean $\bar{x} = \frac{\sum x_i}{n}$	$= \frac{5+10+15+20+25}{5} = \frac{75}{5} = 15$	$= \frac{10+20+30+40+50}{5} = \frac{150}{5} = 30$
Note:	The mean of data set "Y" is double mean value of data set "X".	
Standard deviation $S = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$	$= \sqrt{\frac{(15-15)^2+(10-15)^2+(15-15)^2+(20-15)^2+(25-15)^2}{5-1}}$ $= 7.91$	$= \sqrt{\frac{(10-30)^2+(20-30)^2+(30-30)^2+(40-30)^2+(50-30)^2}{5-1}}$ $= 15.8$
Note:	The standard deviation value of data set "Y" is double standard deviation value of data set "X"	
Standard score $z = \frac{x-\bar{x}}{s}$	$z_1 = \frac{5-15}{7.9} = -1.3$ / $z_2 = \frac{10-15}{7.9} = -0.6$ $z_3 = \frac{15-15}{7.9} = 0$ / $z_4 = \frac{20-15}{7.9} = 0.6$ $z_5 = \frac{25-15}{7.9} = 1.3$	$z_1 = \frac{10-30}{15.8} = -1.3$ / $z_2 = \frac{20-30}{15.8} = -0.6$ $z_3 = \frac{30-30}{15.8} = 0$ / $z_4 = \frac{40-30}{15.8} = 0.6$ $z_5 = \frac{50-30}{15.8} = 1.3$
Note:	The standard score value of data set "Y" is the same standard score value of data set "X".	
CV = $\frac{S}{\bar{x}} \times 100\%$	$= \frac{7.9}{15} \times 100\% = 52.7\%$	$= \frac{15.8}{30} \times 100\% = 52.7\%$
Note:	The CV. value of data set "Y" have the same CV value of data set "X"	

5) first arrange data:

10, 20, 36, 36, 36, 36, 36, 40, 40, 40, 40, 40, 40, 40, 50, 50, 50, 50
50, 56, 56, 56, 60, 60, 60, 60, 60, 60, 60, 70, 70, 70, 70, 70, 70, 70
72, 72, 80, 80, 88, 88, 88, 88, 92, 92, 92, 92, 92, 95

$P_r = \frac{r(n+1)}{100} \rightarrow P_{43} = \frac{43(50+1)}{100} \rightarrow = 47.43$ (k = 47, s = 43)

$P_r = x_k + s(x_{k+1} - x_k) \rightarrow P_{43} = x_{47} + 0.43(x_{47+1} - x_{47}) \rightarrow = 92 + 0.43(92 - 92) \rightarrow = 92$

b. $d_r = \frac{r(n+1)}{10} \rightarrow d_3 = \frac{3(50+1)}{10} \rightarrow 15.3$ (k = 15, s = 3)

$D_r = x_k + s(x_{k+1} - x_k) \rightarrow D_3 = x_{15} + 0.3(x_{15+1} - x_{15}) \rightarrow = 50 + 0.3(50 - 50) \rightarrow = 50$

c. $q_r = \frac{r(n+1)}{4} \rightarrow Q_r = x_k + s(x_{k+1} - x_k)$

$q_1 = \frac{1(50+1)}{4} = 12.75$ (k = 12, s = 75) $\rightarrow Q_1 = x_{12} + 0.75(x_{12+1} - x_{12}) \rightarrow = 40 + 0.75(40 - 40) \rightarrow = 40$

$q_2 = \frac{2(50+1)}{4} = 25.5$ (k = 25, s = 5) $\rightarrow Q_2 = x_{25} + 0.5(x_{25+1} - x_{25}) \rightarrow = 60 + 0.5(60 - 60) \rightarrow = 60$

$q_3 = \frac{3(50+1)}{4} = 38.25$ (k = 38, s = 25) $\rightarrow Q_3 = x_{38} + 0.25(x_{38+1} - x_{38}) \rightarrow = 72 + 0.25(80 - 72) \rightarrow = 74$

d. $L.F = Q_1 - (1.5)(Q_3 - Q_1) \rightarrow = 40 - (1.5)(74 - 40) \rightarrow = -11$

∴ Data have not small extreme value.

$H.F = Q_3 + (1.5)(Q_3 - Q_1) \rightarrow = 74 + (1.5)(74 - 40) \rightarrow = 125$

∴ Data have not great value.

five number are 10, 40, 60, 74, 95

(smallest value, Q_1, Q_2, Q_3, largest value)