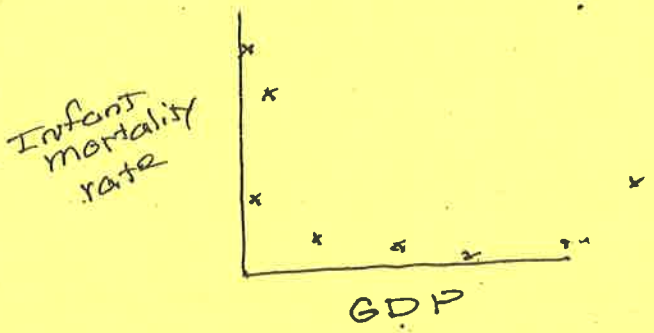
Extra Practice with Correlation and LSRL "by hand"

This data is a comparing Gross Domestic Product, GDP (per capita, inflation adjusted), with Infant Mortality rate, IMR (number of 0-5 year olds dying per 100).

Countries	GDP	IMR
Nigeria	1956	154
Finland	31684	3.3
Bolivia	37313	61
Congo, Dem. Rep	338	199
Mexico	11772	19
China	5450	24
Hungary	17726	7.1
Bangladesh	1326	62
South Korea	22373	5.4

a) make a scatter plot on your GDC and make a sketch of it below



b) comment ON the correlation you see.

There is a weak negative correlation, Not appearing to be linear.

(therefore a summary statement is NOT appropriate)

calculate the correlation coefficient by hand showing both the formula and critical values. (then check against your GDC)

$\bar{x} = 14437.555$

$\bar{y} = 59.422$

$$r = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \cdot \sum (y-\bar{y})^2}} = \frac{-4,288,719}{\sqrt{1508891876 \cdot 40130.46}}$$

$=$

d) Calculate the LSRL by hand in Point-Slope form, showing all details as done in class. If you want you can convert to slope intercept form and check against your GDC.

$$y - \bar{y} = \frac{S_{xy}}{(S_x)^2}(x - \bar{x})$$

$\bar{x} = 14437.555$

$\bar{y} = 59.422$

$S_x = 12948.152$

covariance

$$S_{xy} = \frac{\sum (x-\bar{x})(y-\bar{y})}{n}$$

$$= \frac{-4288719}{9}$$

$$= -476524.333$$

$$y - 59.422 = \frac{-476524.333}{(12948.15)^2}(x - 14437.56)$$

$$y - 59.422 = -0.00284(x - 14438)$$