

Section 3.1

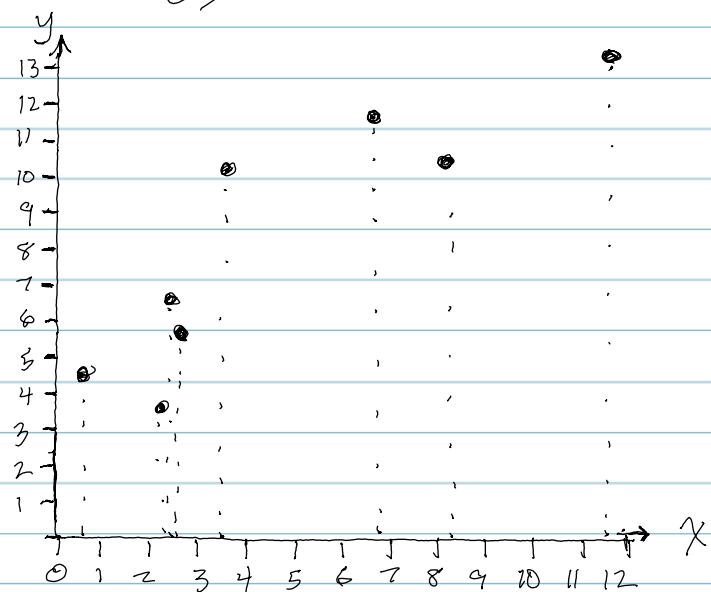
PART I

Correlation

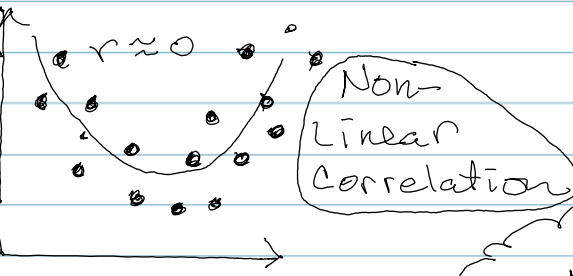
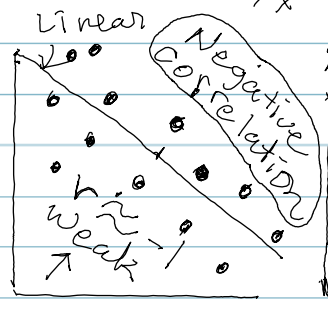
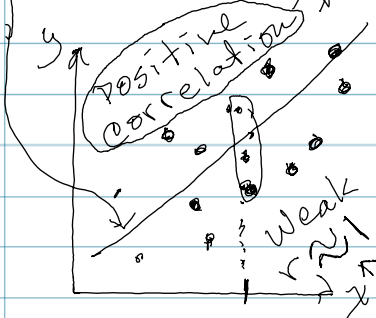
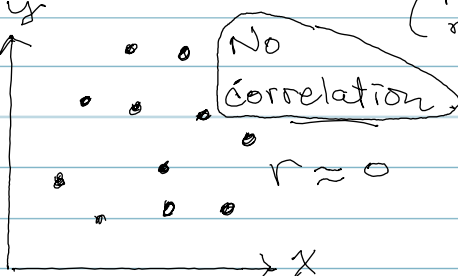
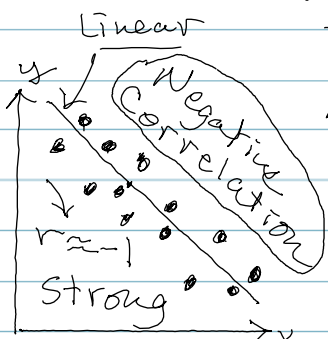
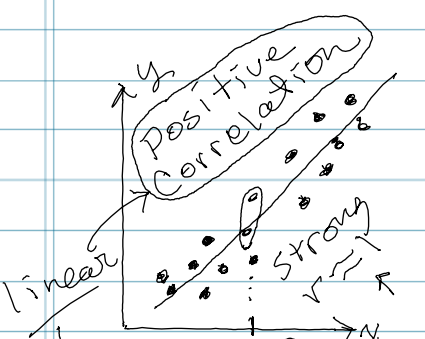
Not cause

Searching for relationships between quantitative variables.

x = Auto. Weapons (1000s)	y = Murder rate (murders/100000)
11.6	13.1 ✓
8.3	10.6
3.6	10.1
0.6	4.4
6.9	11.5
2.5	6.6
2.4	3.6
2.6	5.3



Uphill relationship → Positive Correlation (Positive relationship)



The Linear Correlation Coefficient

Computational Formula

sample :
$$r = \frac{\sum xy - \frac{1}{n}(\sum x)(\sum y)}{\sqrt{\sum x^2 - \frac{1}{n}(\sum x)^2} \cdot \sqrt{\sum y^2 - \frac{1}{n}(\sum y)^2}}$$

population : ρ (rho) (r is used to estimate ρ)