

Section 3.2

Linear Regression

PART I

Deterministic Relationships between 2 variables.

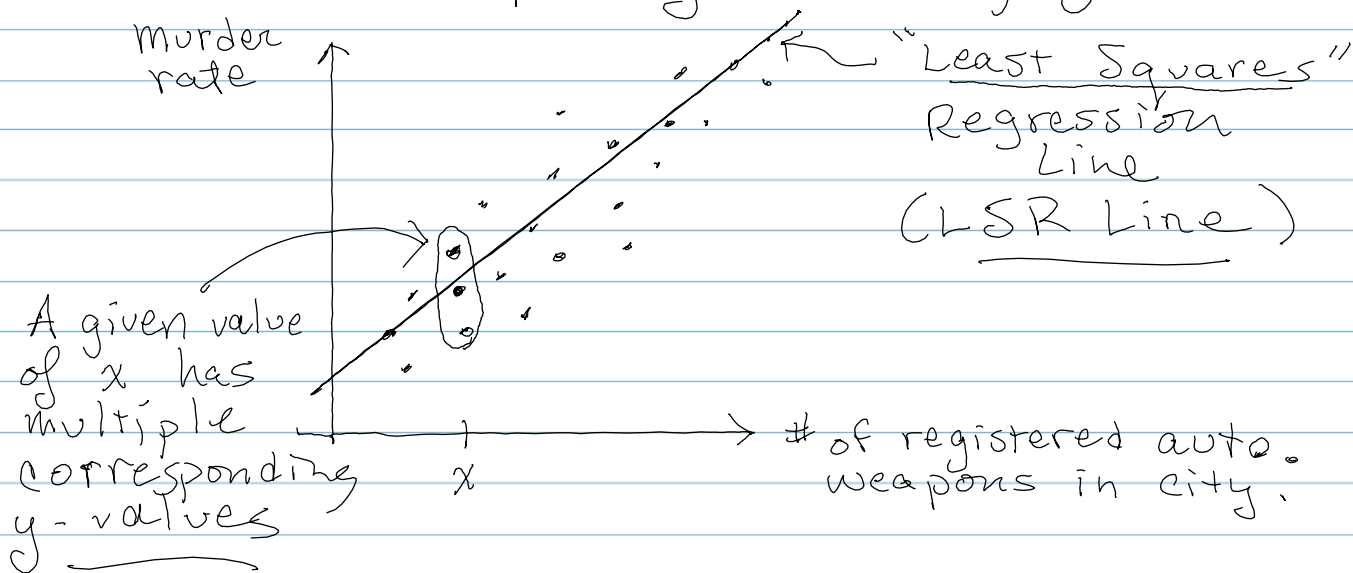
→ For each x , there corresponds a unique value of y .

→ Ex: The relationship between $^{\circ}\text{F}$ & $^{\circ}\text{C}$:

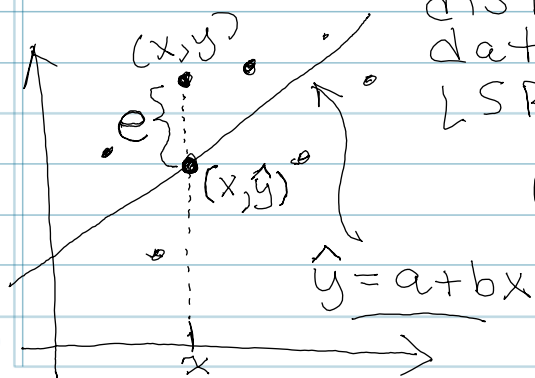
$$F = 32 + 1.8 \cdot C$$

Probabilistic Relationships between 2 variables

→ For each x , there is a distribution of corresponding values of y .



Residuals: A residual is a vertical distance from an observed data point (x, y) to the LSR line.



$$\text{Residual: } e = y - \hat{y}$$

(If (x, y) is above the line, $e > 0$.
If (x, y) is below the line, $e < 0$.)