

BONUS Assignment

Linear Regression & Correlation

(FIRST BONUS ASSIGNMENT OF FIVE)

(X) Calories consumed per day	weight in Lbs (y)	X·y	X ²	y ²
1400	110	154000	1960000	12100
2100	175	367500	4410000	30625
1570	129	202530	2464900	16641
1800	160	288000	3240000	25600
1500	155	232500	2250000	24025
Σ 8370	729	1244530	14324900	108991

(a) Line of BEST FIT

$$b_1 = \frac{SS(XY)}{SS(X)} = \frac{24184}{313520} \approx 0.077$$

$$b_0 = \bar{y} - b_1 \bar{x} = \frac{729}{5} - \left(\frac{24184}{313520}\right) \left(\frac{8370}{5}\right) = 16.67$$

so $\hat{y} = 16.67 + 0.077X$

(b) $r^2 = \frac{(SS(XY))^2}{SS(X)SS(Y)} = \frac{(24184)^2}{(313520)(2702.8)} = 0.690$

$$SS(XY) = \Sigma xy - \frac{\Sigma x \Sigma y}{n} = 1244530 - \frac{(8370)(729)}{5} = 24184$$

$$SS(X) = \Sigma x^2 - \frac{(\Sigma x)^2}{n} = 14324900 - \frac{(8370)^2}{5} = 313520$$

$$SS(Y) = \Sigma y^2 - \frac{(\Sigma y)^2}{n} = 108991 - \frac{(729)^2}{5} = 2702.8$$