Práctica : Regresión Lineal con el Dataset Pressure

Fórmula : $y = \beta_0 + \beta_1 x + \epsilon$

Fórmulas :
$$\beta_1 = \sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y}) / \sum_{i=1}^{n} (x_i - \bar{x})^2$$

$$\beta_0 = \bar{y} - \beta_1 \bar{x}$$

Variables
X (temperature) Independiente
y (pressure) Dependiente

① Cálculo de las Medias

Temperature $\quad \sum x = 3420 / 19 = 180$
Pressure $\quad \sum y = 2,362.3974 / 19 = 124.33.67053$

② Cálculo de la Varianza y Covarianza

Varianza Temperature
$$\sum_{x=1}^{19} = (0 - 180)^2 + (20 - 180)^2 + (40 - 180)^2$$
$$+ (60 - 180)^2 + (80 - 180)^2 + (100 - 180)^2$$
$$+ (120 - 180)^2 + (140 - 180)^2 + (160 - 180)^2$$
$$+ (180 - 180)^2 + (200 - 180)^2 + (220 - 180)^2$$
$$+ (240 - 180)^2 + (260 - 180)^2 + (280 - 180)^2$$
$$+ (300 - 180)^2 + (320 - 180)^2 + (340 - 180)^2$$
$$+ (360 - 180)^2 = 228.000$$

$$\sigma^2 = 228.000 / 1900$$
$$= 1 2000$$

Covarianza Temperature y Pressure

$$\sum_{}^{19} = ((0-180) * (0.0002 - 174.3367)) +$$
$$((20-180) * (0.0012 - 174.3367)) +$$
$$((40-180) * (0.0060 - 174.3367)) +$$
$$((60-180) * (0.0300 - 174.3367)) +$$
$$((80-180) * (0.0900 - 174.3367)) +$$
$$((100-180) * (0.2200 - 174.3367)) +$$
$$((120-180) * (0.7500 - 174.3367)) +$$
$$((140-180) * (1.6300 - 174.3367)) +$$
$$((160-180) * (4.7000 - 174.3367)) +$$
$$((180-180) * (8.8000 - 174.3367)) +$$
$$((200-180) * (17.3000 - 174.3367)) +$$
$$((220-180) * (32.1000 - 174.3367)) +$$
$$((240-180) * (57.0000 - 174.3367)) +$$
$$((260-180) * (96.0000 - 174.3367)) +$$
$$((280-180) * (157.0000 - 174.3367)) +$$
$$((300-180) * (247.0000 - 174.3367)) +$$
$$((320-180) * (376.0000 - 174.3367)) +$$
$$((340-180) * (557.0000 - 174.3367)) +$$
$$((360-180) * (806.0000 - 174.3367))$$
$$= 344834.732$$

Calcular Coeficientes de Regresión

$$BO = \bar{y} - B_1 \bar{x} = 124.3367 - 1.512419877 * 180$$
$$= -147.8988779$$

$$B_1 = \frac{Cov \, xy}{Var \, x} = \frac{344834.732}{228.000} = 1.512419877$$

Predicción $\quad$ pred $= B_0 + B_1 * X$

$$-147.8988779 + 1.5124 79877 * 90$$
$$= -11.78108893$$