4. SIMPLE LINEAR REGRESSION AND SIMPLE LINEAR CORRELATION

4.1. Linear Regression Model

Calculation of the Regression Line:
$Slope = \hat{\beta}_1 = \frac{S_{xy}}{S_{xx}} = \frac{140.5}{14.8333} = 9.4719\%$ per unit effort index.
$y - intercept = \hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x} = 70 - 9.4719 \times 6.8333 = 5.27528\%$
Regression equation: $\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x = 5.27528 + 9.4719x \text{ where } 4.5 \leq x \leq 9.5$

Interpretation of the slope: For every one unit increase in Effor Index, the performance in Chemistry increases by 9.47%.