1. **Problem**

For 60 firms the number of employees X and the amount of expenses for continuing education Y (in EUR) were recorded. The statistical summary of the data set is given by:

	Variable X	Variable Y
Mean	56	259
Variance	113	1792

The correlation between X and Y is equal to 0.52.

Estimate the expected amount of money spent for continuing education by a firm with 62 employees using least squares regression.

Solution

First, the regression line $y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$ is determined. The regression coefficients are given by:

$$\hat{\beta}_1 = r \cdot \frac{s_y}{s_x} = 0.52 \cdot \sqrt{\frac{1792}{113}} = 2.07078,$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \cdot \bar{x} = 259 - 2.07078 \cdot 56 = 143.03654.$$

The estimated amount of money spent by a firm with 62 employees is then given by:

$$\hat{y} = 143.03654 + 2.07078 \cdot 62 = 271.425.$$