

Exercise Series No 5

Exercise 1

We have recorded the fuel consumption (in L/100km) for a car model at different speeds (in km/h). The following table was obtained:

Speed x_i	60	70	90	110	130	150
Fuel consumption y_i	3	3.1	3.7	4.7	6	9

- ❶ Represent the scatter plot of the series (X,Y).
- ❷ Calculate the marginal means, marginal variances, and marginal standard deviations of X and Y.
- ❸ Determine the covariance of X and Y.
- ❹ Find the equation of the regression line of Y as a function of X.
- ❺ Calculate the linear correlation coefficient and draw a conclusion.

Exercise 2

An experiment was conducted on 250 individuals to study the relationship between age X and sleep duration Y. The following table was obtained

X/Y	[5,7[	[7,9[	[9,11[	[11,15[
[1,3[	0	0	2	36
[3,11[	0	3	12	26
[11,19[	2	8	35	16
[19,31[	0	26	22	10
[31,59[	26	15	6	5

- ❶ Determine the two marginal distributions.
- ❷ Compute the marginal means and standard deviations of X and Y.
- ❸ Calculate the covariance and the linear correlation coefficient.
- ❹ Determine the equation of the regression line Y as a function of X
- ❺ Estimate the sleep duration for a 66-year-old individual.