Exercise 33  Method of Least Squares/Regression

Determine a best fit line \( y = a + bx \) (regression line) for the data set already considered in exercise 10, that is, for

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
<th>1</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

a) using the covariance and the variances/standard deviations (see the lecture slides, section on correlation coefficients)

b) using the method of least squares/the system of normal equations!

Draw a diagram of the data points and the regression line!

Exercise 34  Method of Least Squares/Regression

Determine a best fit parabola \( y = a + bx + cx^2 \) (regression parabola) for the data set \((x, y) = ((0, 0), (2, 1), (3, 2), (4, 4))\) with the method of least squares and draw this parabola!

Exercise 35  Multilinear Regression

Determine a best fit plane \( z = a + bx + cy \) for the following data set with the method of least squares: \((x, y, z) = ((0, 1, 0), (0, 4, 2), (2, 0, 1), (3, 1, 2), (2, 3, 3), (4, 4, 4))\).