ZAD. 2

ZESTAW B

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i	x_i	y_i	x_i^2	$(x_i)\cdot(y_i)$	$\hat{y}(x)$	$\hat{y}_i - y_i$	$(\hat{y}_i - y_i)^2$	$(y_i - \bar{y})^2$
1	1	8	1	8	9,5714	1,57	2,4694	64
2	2	13	4	26	11,7143	-1,29	1,6531	9
3	3	14	9	42	13,8571	-0,14	0,0204	4
4	4	17	16	68	16,0000	-1,00	1,0000	1
5	5	18	25	90	18,1429	0,14	0,0204	4
6	6	20	36	120	20,2857	0,29	0,0816	16
7	7	22	49	154	22,4286	0,43	0,1837	36
SUMA	28	112	140	508	112	0	5,4286	134

3-7

$$\begin{cases} a\sum_{i=1}^{n} x_i^2 + b\sum_{i=1}^{n} x_i = \sum_{i=1}^{n} x_i \cdot y_i \\ a\sum_{i=1}^{n} x_i + b\sum_{i=1}^{n} 1 = \sum_{i=1}^{n} y_i \end{cases}$$

$$\begin{cases} 140a + 28b = 508 \\ 28a + 7b = 112 \end{cases}$$

$$W = \begin{vmatrix} 140 & 28 \\ 28 & 7 \end{vmatrix} = 140 \cdot 7 - 28 \cdot 28 = 980 - 784 = 196$$

$$W_a = \begin{vmatrix} 508 & 28 \\ 112 & 7 \end{vmatrix} = 508 \cdot 7 - 112 \cdot 28 = 3556 - 3136 = 420$$

$$W_b = \begin{vmatrix} 140 & 508 \\ 28 & 112 \end{vmatrix} = 140 \cdot 112 - 28 \cdot 508 = 15680 - 14224 = 1456$$

$$a = \frac{W_a}{W} = \frac{420}{196} = \frac{210}{98} = \frac{105}{49} = \frac{15}{7} \approx 2,1429$$

$$b = \frac{W_b}{W} = \frac{1456}{196} = \frac{728}{98} = \frac{364}{49} = \frac{52}{7} \approx 7,4286$$

$$\hat{y} = ax + b$$

$$\hat{y} = \frac{15}{7}x + \frac{52}{7}$$

$$\hat{y} \approx 2,1429x + 7,4286$$

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$\hat{y} = \frac{15}{7}x + \frac{52}{7}$

$\hat{y} \approx 2{,}1429x + 7{,}4286$

$\hat{y}(1) = \frac{15}{7} \cdot 1 + \frac{52}{7} = \frac{67}{7} \approx 9{,}5714$

$\hat{y}(2) = \frac{15}{7} \cdot 2 + \frac{52}{7} = \frac{30}{7} + \frac{52}{7} = \frac{82}{7} \approx 11{,}7143$

$\hat{y}(3) = \frac{15}{7} \cdot 3 + \frac{52}{7} = \frac{45}{7} + \frac{52}{7} = \frac{97}{7} \approx 13{,}8571$

$\hat{y}(4) = \frac{15}{7} \cdot 4 + \frac{52}{7} = \frac{60}{7} + \frac{52}{7} = \frac{112}{7} = 16 = 16{,}0000$

$\hat{y}(5) = \frac{15}{7} \cdot 5 + \frac{52}{7} = \frac{75}{7} + \frac{52}{7} = \frac{127}{7} \approx 18{,}1429$

$\hat{y}(6) = \frac{15}{7} \cdot 6 + \frac{52}{7} = \frac{90}{7} + \frac{52}{7} = \frac{142}{7} \approx 20{,}2857$

$\hat{y}(7) = \frac{15}{7} \cdot 7 + \frac{52}{7} = \frac{105}{7} + \frac{52}{7} = \frac{157}{7} \approx 22{,}4286$

4-7

$\bar{y} = \frac{1}{n} \sum_{i=1}^{n} y_i$

$\bar{y} = \frac{1}{7} \cdot 112 = \frac{112}{7} = 16$

$\bar{y} = 16$

$\hat{y}(x) = \hat{y}_i$

$\hat{y}_i - y_i = ?$

$\hat{y}_1 - y_1 = \frac{67}{7} - 8 = \frac{67}{7} - \frac{56}{7} = \frac{11}{7} \approx 1{,}57$

$\hat{y}_2 - y_2 = \frac{82}{7} - 13 = \frac{82}{7} - \frac{91}{7} = -\frac{9}{7} \approx -1{,}29$

$\hat{y}_3 - y_3 = \frac{97}{7} - 14 = \frac{97}{7} - \frac{98}{7} = -\frac{1}{7} \approx -0{,}14$

$\hat{y}_4 - y_4 = \frac{112}{7} - 17 = \frac{112}{7} - \frac{119}{7} = -\frac{7}{7} = -1{,}00$

$\hat{y}_5 - y_5 = \frac{127}{7} - 18 = \frac{127}{7} - \frac{126}{7} = \frac{1}{7} \approx 0{,}14$

$\hat{y}_6 - y_6 = \frac{142}{7} - 20 = \frac{142}{7} - \frac{140}{7} = \frac{2}{7} \approx 0{,}29$

$\hat{y}_7 - y_7 = \frac{157}{7} - 22 = \frac{157}{7} - \frac{154}{7} = \frac{3}{7} \approx 0{,}43$

$\hat{y}_i - y_i = 0$

$(\hat{y}_1 - y_1)^2 \approx 2{,}4694$

$(\hat{y}_2 - y_2)^2 \approx 1{,}6531$

$(\hat{y}_3 - y_3)^2 \approx 0{,}0204$

$(\hat{y}_4 - y_4)^2 = 1{,}000$

$(\hat{y}_5 - y_5)^2 \approx 0{,}0204$

$(\hat{y}_6 - y_6)^2 \approx 0{,}0816$

$(\hat{y}_7 - y_7)^2 \approx 0{,}1837$

$(\hat{y}_i - y_i)^2 \approx 5{,}4286$

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$(y_i - \bar{y})^2 = ?$

$\bar{y} = 16$

$(y_1 - \bar{y})^2 = (8-16)^2 = (-8)^2 = 64$

$(y_2 - \bar{y})^2 = (13-16)^2 = (-3)^2 = 9$

$(y_3 - \bar{y})^2 = (14-16)^2 = (-2)^2 = 4$

$(y_4 - \bar{y})^2 = (17-16)^2 = (1)^2 = 1$

$(y_5 - \bar{y})^2 = (18-16)^2 = (2)^2 = 4$

$(y_6 - \bar{y})^2 = (20-16)^2 = (4)^2 = 16$

$(y_7 - \bar{y})^2 = (22-16)^2 = (6)^2 = 36$

$\sum_{i=1}^{n} (y_i - \bar{y})^2 = 134$

$R^2 = 1 - \frac{\sum_{i=1}^{n} (\hat{y}_i - y_i)^2}{\sum_{i=1}^{n} (y_i - \bar{y})^2}, \quad 0 \le R^2 \le 1$

$R^2 = 1 - \frac{5,4286}{134}$

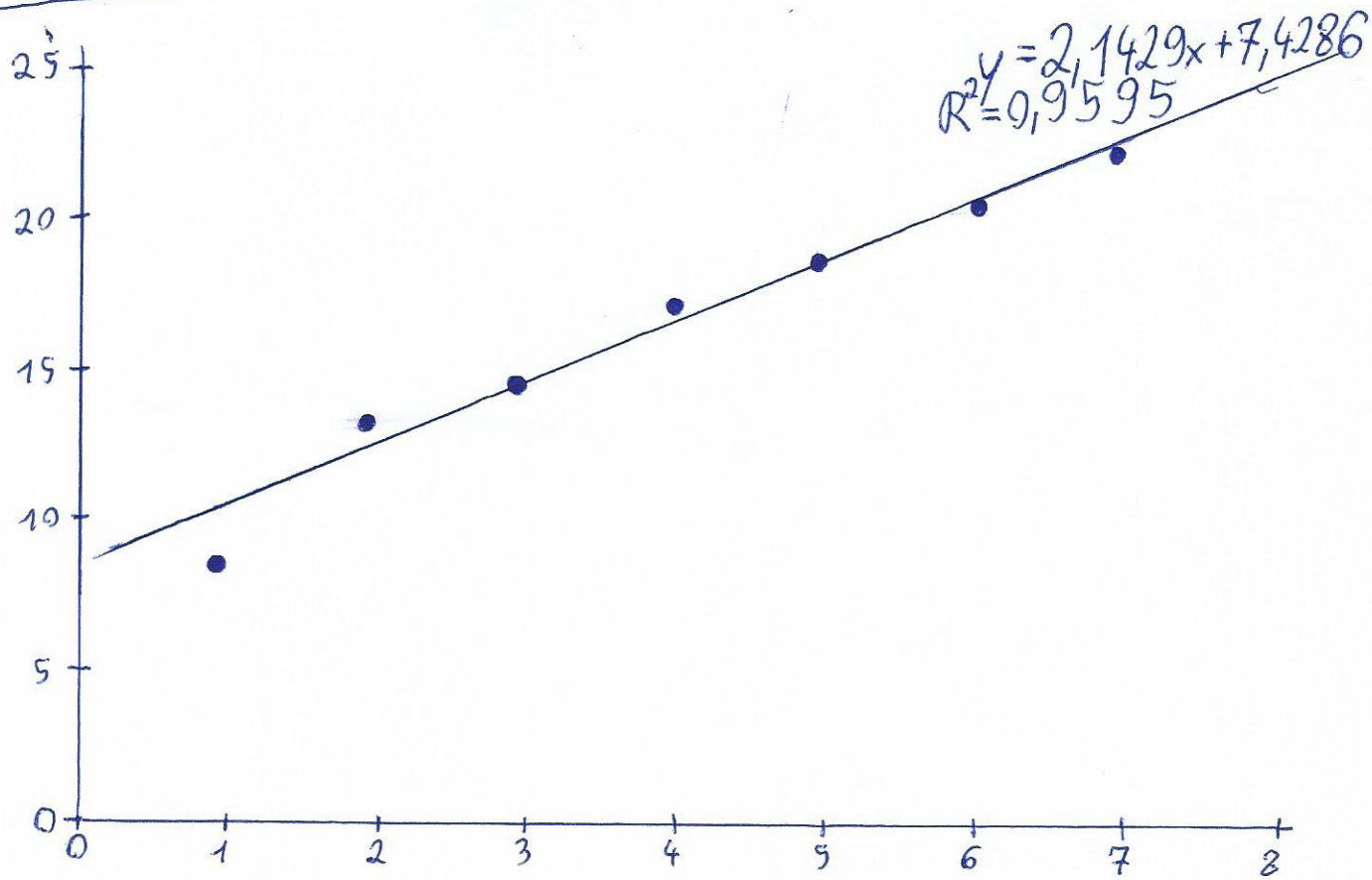
[illegible]

[illegible]

$R^2 \approx 1 - 0,0405$

$R^2 \approx 0,9595$

5 - 7



$a = \frac{15}{7} \approx 2,1429$

$b = \frac{52}{7} \approx 7,4286$

$\hat{y} = \frac{15}{7}x + \frac{52}{7}$

$\hat{y} \approx 2,1429x + 7,4286$

$\bar{y} = 16$

$\sum_{i=1}^{n} (\hat{y}_i - y_i)^2 = 5,4286$

$\sum_{i=1}^{n} (y_i - \bar{y}) = 134$

$R^2 \approx 0,9595$