

التصحيح النموذجي

التمرين الأول (10 ن)

Xt	MMc(6)	Sj	Sjfin	Ycvs
13.3			-1.108	14.408
15.1			-0.161	15.261
14.8			-0.102	14.902
16.3	14.792	1.508	2.023	14.277
14.8	14.758	0.042	0.050	14.750
14.2	14.625	-0.425	-0.702	14.902
13.8	14.625	-0.825	-1.108	14.908
14.2	14.717	-0.517	-0.161	14.361
14.1	14.800	-0.700	-0.102	14.202
17	14.900	2.100	2.023	14.977
15.2	15.100	0.100	0.050	15.150
14.8	15.425	-0.625	-0.702	15.502
14.4	15.725	-1.325	-1.108	15.508
16	15.933	0.067	-0.161	16.161
16.2	16.058	0.142	-0.102	16.302
18.5	16.183	2.317	2.023	16.477
16.2	16.333	-0.133	0.050	16.150
15.3	16.500	-1.200	-0.702	16.002
15.4	16.717	-1.317	-1.108	16.508
16.8	16.975	-0.175	-0.161	16.961
17.4	17.292	0.108	-0.102	17.502
19.9			2.023	17.877
17.9			0.050	17.850
17.4			-0.702	18.102

Sjbar

Sjfin

1	2	3	4	5	6	
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-0.825	-0.517	-0.700	2.100	0.100	-0.625	
-1.325	0.067	0.142	2.317	0.133	-1.200	
-1.317	-0.175	0.108	--	--	--	
-1.156	-0.208	-0.150	1.975	0.003	-0.750	-0.286
-1.108	-0.161	-0.102	2.023	0.050	-0.702	0.000

$$\begin{aligned} \bar{T} &= 12.500 \\ \bar{Y} &= 15.792 \\ \sum T^2 &= 4900.000 \\ \sum YT &= 4916.728 \end{aligned}$$

$$\hat{\alpha} = 13.844$$

$$\hat{\beta} = 0.156$$

$$Y = 13.843 + 0.156X$$

$$Y_{\text{jan/fev}} = 17.740$$

$$Y_{\text{prev}} = 16.632$$

التمرين الثاني (10 ن)

$$Y = \beta_1 + \beta_2 X_2 + \beta_4 X_4 + \varepsilon$$

$$\begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_4 \end{bmatrix} = \begin{bmatrix} n & \sum x_2 & \sum x_4 \\ \sum x_2 & \sum x_2^2 & \sum x_2 x_4 \\ \sum x_4 & \sum x_2 x_4 & \sum x_4^2 \end{bmatrix}^{-1} \begin{bmatrix} \sum y \\ \sum y x_2 \\ \sum y x_4 \end{bmatrix}$$

$$\begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \end{bmatrix} = \begin{bmatrix} 5 & 194 & 134 \\ 194 & 7932 & 5053 \\ 134 & 5053 & 3984 \end{bmatrix}^{-1} \begin{bmatrix} 577 \\ 23190 \\ 15268 \end{bmatrix}$$

$$= \frac{1}{688155} \begin{bmatrix} 6068279 & -95794 & -82606 \\ -95794 & 1964 & 731 \\ -82606 & 731 & 2024 \end{bmatrix} \begin{bmatrix} 577 \\ 23190 \\ 15268 \end{bmatrix} = \begin{bmatrix} 27.178 \\ 2.082 \\ 0.277 \end{bmatrix}$$

$$Y = 27.178 + 2.082X_2 + 0.277X_4 + e$$

$$Y = \beta_2 X_2 + \beta_4 X_4 + \varepsilon$$

$$\begin{bmatrix} \beta_2 \\ \beta_4 \end{bmatrix} = \begin{bmatrix} \sum x_2^2 & \sum x_2 x_4 \\ \sum x_2 x_4 & \sum x_4^2 \end{bmatrix}^{-1} \begin{bmatrix} \sum y x_2 \\ \sum y x_4 \end{bmatrix}$$

$$\begin{bmatrix} \beta_2 \\ \beta_4 \end{bmatrix} = \begin{bmatrix} 7932 & 5053 \\ 5053 & 3984 \end{bmatrix} \begin{bmatrix} 23190 \\ 15268 \end{bmatrix} = \frac{1}{6068279} \begin{bmatrix} 3984 & -5053 \\ -5053 & 7932 \end{bmatrix} \begin{bmatrix} 23190 \\ 15268 \end{bmatrix} = \begin{bmatrix} 2.511 \\ 0.647 \end{bmatrix}$$

$$Y = 2.511X_2 + 0.647X_4 + e$$

$$Y = \beta_1 + \beta_3 X_3 + \varepsilon$$

$$\begin{bmatrix} \beta_1 \\ \beta_3 \end{bmatrix} = \begin{bmatrix} n & \sum x_3 \\ \sum x_3 & \sum x_3^2 \end{bmatrix}^{-1} \begin{bmatrix} \sum y \\ \sum y x_3 \end{bmatrix}$$

$$\begin{bmatrix} \beta_1 \\ \beta_3 \end{bmatrix} = \begin{bmatrix} 5 & 27 \\ 27 & 163 \end{bmatrix}^{-1} \begin{bmatrix} 577 \\ 3282 \end{bmatrix} = \frac{1}{86} \begin{bmatrix} 163 & -27 \\ -27 & 5 \end{bmatrix} \begin{bmatrix} 577 \\ 3282 \end{bmatrix} = \begin{bmatrix} 63.211 \\ 9.663 \end{bmatrix}$$

$$Y = 63.211 + 9.663X_3 + \varepsilon$$

$$Y = \beta_4 X_4 + \varepsilon$$

$$\beta_4 = \left[\sum x_4^2 \right]^{-1} \left[\sum y x_4 \right] = \frac{\sum y x_4}{\sum x_4^2} = \frac{15268}{3984} = 3.832$$

$$Y = 3.832X_4 + e$$