

LAMPIRAN 15
Regresi X2 Terhadap Y

No. Res	X2	Y	X2 ²	Y ²	X2Y
1	63	58	3909	3349	3619
2	54	64	2960	4062	3468
3	53	66	2793	4404	3507
4	45	62	2037	3849	2800
5	60	55	3659	3005	3316
6	67	55	4427	2993	3640
7	59	55	3474	3031	3245
8	52	60	2745	3654	3167
9	54	68	2865	4604	3632
10	59	63	3455	3942	3690
11	66	66	4327	4375	4351
12	58	51	3370	2608	2965
13	48	61	2326	3765	2960
14	46	66	2153	4325	3051
15	56	62	3190	3831	3496
16	64	43	4057	1839	2731
17	59	40	3538	1585	2368
18	42	68	1761	4614	2851
19	39	68	1511	4575	2629
20	66	57	4341	3205	3730
21	66	42	4339	1737	2745
22	54	50	2959	2481	2709
23	57	53	3196	2786	2984
24	62	65	3786	4186	3981
25	67	64	4437	4147	4289
26	69	66	4745	4382	4560
27	59	45	3518	2030	2672
28	33	50	1122	2523	1683
29	65	61	4191	3692	3933
30	53	55	2797	2993	2893
31	50	55	2498	3031	2751
32	41	60	1717	3654	2505
33	57	68	3196	4604	3836
34	62	60	3786	3560	3671
35	67	41	4437	1700	2746
36	40	69	1604	4828	2783
37	48	58	2324	3377	2801
38	51	56	2609	3088	2838
39	62	43	3876	1850	2678
40	62	63	3853	3941	3897

41	64	68	4147	4680	4405
42	43	63	1857	4006	2728
43	49	55	2373	2993	2665
44	59	58	3474	3335	3404
45	52	51	2745	2603	2673
46	54	59	2865	3447	3143
47	59	67	3455	4429	3912
48	66	55	4327	3016	3613
49	58	63	3370	3986	3665
50	56	63	3084	3992	3509
51	55	53	3019	2842	2929
52	38	46	1459	2126	1761
53	59	54	3448	2965	3198
54	62	63	3804	3926	3865
55	60	66	3605	4358	3964
56	46	68	2131	4636	3143
57	52	54	2706	2904	2803
58	49	45	2449	2050	2241
59	65	58	4251	3355	3777
60	54	56	2917	3128	3021
61	59	60	3534	3546	3540
62	50	63	2510	3961	3153
63	50	68	2540	4660	3441
64	59	64	3513	4141	3814
65	55	63	2975	3990	3446
66	50	53	2472	2848	2653
67	50	46	2459	2153	2301
68	43	55	1886	3004	2380
69	58	63	3306	3944	3611
70	59	66	3481	4400	3914
71	60	68	3548	4565	4025
72	52	54	2676	2964	2816
73	51	45	2584	2026	2288
74	49	58	2405	3338	2833
75	59	56	3520	3150	3330
76	55	59	3045	3530	3278
77	60	57	3642	3241	3435
78	51	69	2575	4703	3480
79	56	62	3105	3877	3470
80	54	68	2910	4608	3662
81	45	63	2067	3909	2842
Jumlah	4459	4736	250129	281542	260303

- 1, Menghitung nilai b dengan rumus:

$$b = \frac{n \sum XY - \sum X \sum Y}{n \sum X^2 - (\sum X)^2}$$

$$b = \frac{81(260303) - (4459)(4736)}{81(250129) - (4459)^2} = \frac{7880520 - 7780968}{8745780 - 8608356} = \frac{99552}{137424}$$

$$b = 0,724$$

- 2, Menghitung nilai a dengan rumus:

$$a = \frac{\sum Y - b \sum X}{n}$$

$$a = \frac{4736 - (0,724)(4459)}{81} = \frac{527,784}{81} = 22,796$$

Sehingga persamaan regresi yang terbentuk adalah:

$$\hat{Y} = 22,796 + 0,724X$$

- 3, Menguji Signifikansi

- a. Mencari Jumlah Kuadrat Total (JK T)

$$JK \text{ Total} = \sum Y^2 - \frac{(\sum Y)^2}{n} = 281542 - \frac{(4736)^2}{81} = 6906,654$$

- b. Mencari Jumlah Kuadrat Regresi (JK Reg (a))

$$JK \text{ Reg (a)} = \frac{(\sum Y)^2}{n} = \frac{(4736)^2}{81} = \frac{21827584}{81} = 269476,346$$

- c. Mencari Jumlah Kuadrat Regresi (JK Reg (b|a))

$$\begin{aligned} JK \text{ Reg (b | a)} &= b \left\{ \sum XY - \frac{(\sum X)(\sum Y)}{n} \right\} \\ &= 0,724 \left\{ 260303 - \frac{(4459)(4736)}{81} \right\} \\ &= (0,724)(1259,2) \\ &= 911,661 \end{aligned}$$

- d. Mencari Jumlah Kuadrat Residu (JK Res)

$$\begin{aligned} JK \text{ Res} &= \sum Y^2 - JK \text{ Reg (b|a)} - JK \text{ Reg (a)} \\ &= 281542 - 911,661 - 269476,346 \end{aligned}$$

$$= 1885,939$$

- e. Mencari Rata-rata Jumlah Kuadrat Regresi (RJK Reg(a))

$$RJKReg(a) = JKReg(a) = 117218,4$$

- f. Mencari Rata-rata Jumlah Kuadrat Regresi (RJK Reg(b|a))

$$RJKReg(b|a) = JKReg(b|a) = 911,661$$

- g. Mencari Rata-rata Jumlah Kuadrat Residu (RJK Res)

$$RJK\ Res = \frac{JKRe\ s}{n-2} = \frac{1885,939}{79} = 23,873$$

- h. Menguji Signifikansi dengan Rumus:

$$F_{hitung} = \frac{RJK\ Re\ g(b|a)}{RJK\ Res} = \frac{911,661}{23,873} = 38,188$$

Ftabel pada dk (1;80) pada $\alpha=0,05$ adalah 3,960

4, Menguji Linearitas

- a. Mencari Jumlah Kuadrat Error (JKE) dengan rumus:

$$JKE = \sum_k \left\{ \sum Y^2 - \frac{(\sum Y)^2}{n} \right\}$$

Mencari JKE dengan tabel penolong berikut:

Res	X1	Y	N	db	JK	Rata-rata	Jumlah
1	63	58	1				
2	54	64	1				
3	53	66	2				
4	45	62		1	2576.381	64.19991	40.1306
5	60	55	1				
6	67	55	2				
7	59	55		1	2291.196	54.87901	41.74995
8	52	60	2				
9	54	68		1	2813.584	64.15257	43.8577
10	59	63	3				
11	66	66					
12	58	51		2	2128.896	58.60773	36.3245
13	48	61	1				
14	46	66	2				
15	56	62		1	2570.578	63.83066	40.27185
16	64	43	3				
17	59	40					
18	42	68		2	2816.615	53.8709	52.28453

19	39	68	2				
20	66	57		1	2354.766	62.12211	37.90545
21	66	42	2				
22	54	50		1	2077.295	45.74376	45.41155
23	57	53	4				
24	62	65					
25	67	64					
26	69	66		3	72.12372	65.29441	1.104593
27	59	45	3				
28	33	50					
29	65	61		2	2524.14	55.49703	45.48244
30	53	55	2				
31	50	55		1	2291.196	54.87901	41.74995
32	41	60	3				
33	57	68					
34	62	60		2	2479.552	63.76105	38.88819
35	67	41	3				
36	40	69					
37	48	58		2	2415.916	63.79528	37.86983
38	51	56	4				
39	62	43					
40	62	63					
41	64	68		3	2836.339	65.59369	43.24103
42	43	63	3				
43	49	55					
44	59	58		2	2401.191	56.22698	42.70531
45	52	51	3				
46	54	59					
47	59	67		2	2760.519	62.63352	44.07414
48	66	55	4				
49	58	63					
50	56	63					
51	55	53		3	2220.193	58.24776	321,00
52	38	46	3				
53	59	54					
54	62	63		2	2601.716	58.55898	44.42898
55	60	66	4				
56	46	68					
57	52	54					
58	49	45		3	1892.295	49.58014	38.16639
59	65	58	3				
60	54	56					

61	59	60		2	2474.714	57.74051	42.85924
62	50	63	5				
63	50	68					
64	59	64					
65	55	63					
66	50	53		4	2222.475	58.26836	38.14205
67	50	46	4				
68	43	55					
69	58	63					
70	59	66		3	2751.417	64.56642	42.61374
71	60	68	3				
72	52	54					
73	51	45		2	1881.747	49.73039	37.83897
74	49	58	3				
75	59	56					
76	55	59		2	2469.185	57.77049	42.74129
77	60	57	3				
78	51	69					
79	56	62		2	2585.559	65.42123	39.52171
80	54	68	2				
81	45	63		1	2596.044	65.20308	39.81474
Σ	4459	4736	81	51			999.1787

$$JKE = \left(39^2 - \frac{39^2}{1} \right) + \left(45^2 - \frac{45^2}{1} \right) + \dots + \left(36^2 - \frac{36^2}{1} \right).$$

$$JKE = (0 + 0 + 86 + \dots + 0)$$

$$JKE = 823,65$$

- b. Mencari Jumlah Kuadrat Tuna Cocok (JKTC) dengan rumus:

$$\begin{aligned} JKTC &= JKRes - JKE \\ &= 1885,939 - 823,65 \\ &= 1062,289 \end{aligned}$$

- c. Mencari Rata-rata Jumlah Kuadrat Tuna Cocok (JKTC) dengan rumus:

$$RJKTC = \frac{JKTC}{k-2} = \frac{1062,289}{27-2} = 42,491$$

- d. Mencari Rata-rata Jumlah Kuadrat Error (JKE) dengan rumus:

$$RJKE = \frac{JKE}{n-k} = \frac{823,65}{81-27} = \frac{823,65}{54} = 29,959$$

- e. Mencari F hitung dengan rumus:

$$F_{hitung} = \frac{RJKTC}{RJKE} = \frac{42,491}{29,959} = 1,418$$

Ftabel pada dk (27,81) pada $\alpha=0,05$ adalah 1,763
 Menghitung nilai korelasi X_2 dan Y (r_{x_2y})

$$r_{x_2y} = \frac{n \sum X_2 Y - (\sum X_2)(\sum Y)}{\sqrt{(n \sum X_2^2 - (\sum X_2)^2)(n \sum Y^2 - (\sum Y)^2)}}$$

$$r_{x_2y} = \frac{81(260303) - (4459)(4736)}{\sqrt{(81(250129) - (4459)^2)(81(281542) - (4736)^2)}}$$

$$r_{x_2y} = \frac{22081815 - 22050263}{\sqrt{(375206)(559439)}} = \frac{31552}{49576,896} = 0,636$$

Besarnya nilai koefisien determinasi (r^2) adalah:

$$r^2 = (r_{x_1y})^2 = (0,636)^2 = 0,404 = 40,4\%$$

Untuk menguji signifikansi r dilakukan dengan mencari nilai t hitung dengan rumus:

$$\begin{aligned} t \text{ hitung} &= \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \\ &= \frac{0,636\sqrt{79}}{\sqrt{1-(0,636)^2}} \\ &= \frac{5,653}{0,596} = 9,485 \end{aligned}$$

t tabel pada dk (81-2=79) pada $\alpha=0,05$ adalah 1,990