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3. Dik: $n = 15$

$\alpha = 5\%$

No	X	Y	Gall (d) (y-x)	xd	xd^2
1	158	91	-67	-121.1	14.665.21
2	92	59	-33	-87.1	7586.41
3	65	215	150	95.9	9196.81
4	98	226	128	73.9	5461.21
5	33	223	190	135.9	18468.81
6	89	91	-2	-82.1	2714.41
7	148	92	-56	-110.1	12122.01
8	58	177	119	64.9	4212.01
9	142	134	-8	-62.1	3856.41
10	117	116	-1	-55.1	3036.01
11	74	183	79	24.9	620.01
12	66	219	153	98.9	9781.21
13	109	143	34	-20.1	404.01
14	57	164	107	82.9	2798.41
15	88	100	15	-39.1	4774.81
Σ			812		99700.75

(1) Hipotesis

$$H_0 : \rho = 0$$

$$H_a : \rho \neq 0$$

(2) hitung nilai Rata-rata dari gall (d)

$$Md = \frac{\sum d}{n}$$

$$= \frac{812}{15} = 54.13$$

(3) menentukan t hitung

$$t = \frac{Md}{\sqrt{\frac{\sum d^2}{n(n-1)}}} = \frac{54.1}{\sqrt{\frac{99700.75}{15(15-1)}}} = 2.482$$

$$t_{\text{tabel}} = \alpha = 0.05$$

$$db = n - 1$$

$$= 15 - 1$$

$$= 14$$

$$t_{\text{tabel}} = 2.142$$

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$2.482 > 2.142$$

Maka H_0 ditolak

① Kesimpulan

Dengan $\alpha = 5\%$ atau 0.05

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$2.482 > t_{\text{tabel}}$$

kerena t_{hitung} lebih besar dari t_{tabel} maka H_0 ditolak

10.501.51	0.501	0.501	0.501	0.501	0.501
10.510.51	0.510	0.510	0.510	0.510	0.510
10.520.51	0.520	0.520	0.520	0.520	0.520
10.530.51	0.530	0.530	0.530	0.530	0.530
10.540.51	0.540	0.540	0.540	0.540	0.540
10.550.51	0.550	0.550	0.550	0.550	0.550
10.560.51	0.560	0.560	0.560	0.560	0.560
10.570.51	0.570	0.570	0.570	0.570	0.570
10.580.51	0.580	0.580	0.580	0.580	0.580
10.590.51	0.590	0.590	0.590	0.590	0.590
10.600.51	0.600	0.600	0.600	0.600	0.600
10.610.51	0.610	0.610	0.610	0.610	0.610
10.620.51	0.620	0.620	0.620	0.620	0.620
10.630.51	0.630	0.630	0.630	0.630	0.630
10.640.51	0.640	0.640	0.640	0.640	0.640
10.650.51	0.650	0.650	0.650	0.650	0.650
10.660.51	0.660	0.660	0.660	0.660	0.660
10.670.51	0.670	0.670	0.670	0.670	0.670
10.680.51	0.680	0.680	0.680	0.680	0.680
10.690.51	0.690	0.690	0.690	0.690	0.690
10.700.51	0.700	0.700	0.700	0.700	0.700

② Kesimpulan

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$2.482 > t_{\text{tabel}}$$

③ Kesimpulan

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$t_{\text{hitung}} > t_{\text{tabel}}$$

④ Kesimpulan

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$t_{\text{hitung}} > t_{\text{tabel}}$$

$$t_{\text{hitung}} > t_{\text{tabel}}$$

4. * Hipotesis

$$H_0 : \mu_1 = \mu_2 = \mu_3$$

H_1 : Minimal ada 1 Potongan n yang berbeda

* Hitung nilai F tabel

Pengamatan	Program 1		Program 2		Program 3		Program 4		total
	x_1	x_1^2	x_2	x_2^2	x_3	x_3^2	x_4	x_4^2	
1	9	81	10	100	12	144	9	81	
2	12	144	6	36	14	196	8	64	
3	14	196	9	81	11	121	11	121	
4	11	121	9	81	13	169	7	49	
5	13	169	10	100	11	121	8	64	
Tk	59		44		61		43		207
nk	5		5		5		5		20
Σx^2		711		398		751		379	2239

$$dk \text{ Pembilang} = k - 1$$

$$= 4 - 1$$

$$= 3$$

$$dk \text{ Penyebut} = n - k$$

$$= 20 - 4$$

$$= 16$$

$$F_{\text{tabel}} = 3,24$$

$$JKA = \sum \left[\frac{T_k^2}{nk} \right] - \frac{(\Sigma x)^2}{n}$$

$$= \left[\frac{59^2}{5} + \frac{44^2}{5} + \frac{61^2}{5} + \frac{43^2}{5} \right] - \frac{207^2}{20}$$

$$= \frac{1099}{20} = 54,95$$

$$JKK = \Sigma (x^2) - \sum \left[\frac{T_k^2}{nk} \right]$$

$$= 2239 - \left[\frac{59^2}{5} + \frac{44^2}{5} + \frac{61^2}{5} + \frac{43^2}{5} \right]$$

$$= \frac{208}{5} = 41,6$$

$$JK_T = JK_A + JK_K$$

$$= 59.95 + 41.6$$

$$= 96.55$$

$$KMA = \frac{JK_A}{K-1} = \frac{59.95}{4-1}$$

$$= 19.98$$

$$KMK = \frac{JK_K}{n-k}$$

$$= 41.6$$

$$F_{hitung} = \frac{JK_A / K-1}{JK_K / n-k}$$

$$= \frac{KMA}{KMK}$$

$$= \frac{19.98}{2.6}$$

$$= 7.0446$$

• Kesimpulan

$$F_{hitung} 7.0446 > 3.24$$

Maka H_0 ditolak. Perbedaan signifikan 5% atau 0.05.

2.	X_A	X_B	$d_A = X_A - x_{sA}$	$d_B = X_B - x_{sB}$	d_A^2	d_B^2
	102	81	4,6	-29	21,16	841
	86	165	-11,4	55	129,96	3025
	98	97	0,6	-13	0,36	169
	109	134	11,6	24	134,56	576
	92	92	-5,4	-18	29,16	324
		87		-23		529
		114		4		16
	$\Sigma = 487$	$\Sigma = 720$			$\Sigma = 315,2$	$\Sigma = 5480$

$$\bar{X}_A = \frac{\Sigma X_A}{n} = \frac{487}{5} = 97,4 \quad S^2_A = \frac{\sum (x_j - \bar{x})^2}{n-1}$$

$$\bar{X}_B = \frac{\Sigma X_B}{n} = \frac{720}{7} = 102,857$$

$$= \frac{315,2}{5-1} = 78,8$$

$$S^2_B = \frac{\sum (x_j - \bar{x})^2}{n-1}$$

$$= \frac{5480}{7-1} = 913,3$$

* Hipotesis

$$H_0 : \mu_B - \mu_A \geq 10$$

$$H_1 : \mu_B - \mu_A < 10$$

* taraf Signifikan = 0,1

* Perhitungan t

$$t = \frac{(\bar{x}_B - \bar{x}_A) - (\mu_B - \mu_A)}{\sqrt{\frac{S^2_A}{n_A} + \frac{S^2_B}{n_B}}}$$

$$\sqrt{\frac{S^2_A}{n_A} + \frac{S^2_B}{n_B}}$$

$$= \frac{(102,857 - 97,4) - (10)}{\sqrt{\frac{78,8}{5} + \frac{913,3}{7}}} = \frac{12,657 - 10}{\sqrt{15,76 + 130,47}}$$

$$= \frac{2,657}{\sqrt{146,23}} = 0,21$$

* Derajat kebebasan

$$v = \left(\frac{S^2_1}{n_1} + \frac{S^2_2}{n_2} \right)^2$$

$$\frac{(S^2_1/n_1)^2}{n_1-1} + \frac{(S^2_2/n_2)^2}{n_2-1}$$

$$= \frac{\left(\frac{78.8}{5} + \frac{913.3}{7} \right)^2}{\frac{\left(\frac{78.8}{5} \right)^2}{5-1} + \frac{\left(\frac{913.3}{7} \right)^2}{7-1}}$$

$$= \frac{146.23^2}{\frac{248.37}{4} + \frac{17022.42}{6}}$$

$$= \frac{21383.21}{2899.16} = \underline{\underline{7.37}}$$

Nilai kritis - $t_{0.1} = 1.415$ untuk derajat kebebasan $u = \underline{\underline{7.37}}$
 Tolak H_0 jika $t < -1.415$

* Perhitungan Statistik

$$t_{hitung} = \frac{(\bar{X}_B - \bar{X}_A) - (\mu_B - \mu_A)}{\sqrt{\frac{s^2_A}{n_A} + \frac{s^2_B}{n_B}}}$$

$$= \frac{(110 - 97.4) - (10)}{\sqrt{\frac{78.8}{5} + \frac{913.3}{7}}}$$

$$= \underline{\underline{0.21}}$$

* Kesimpulan

$$0.21 > 1.45$$

karena $t_{hitung} > 1.415$, maka H_0 diterima, lama waktu film A memang lebih dari 10 menit dan pada film B

1. * Hipotesis

$$H_0 : \geq 0.8$$

$$H_A : < 0.8$$

$$\alpha = 0.05 \text{ atau } 5\%$$

* Perhitungan Z

$$Z = \frac{\frac{a}{n} - \pi}{\sqrt{\frac{\pi \cdot (1-\pi)}{n}}} = \frac{\frac{250}{300} - 0.8}{\sqrt{\frac{0.8 \cdot (1-0.8)}{300}}} = 1.443$$

$$\begin{aligned} Z_{\alpha} &= 0.5 - \alpha \\ &= 0.5 - 0.05 \\ &= 0.45 \end{aligned}$$

$$Z_{0.45} = 1.65$$

* Kriteria Uji

$$Z < -Z_{\alpha} \text{ , } H_0 \text{ ditolak}$$

$$Z \geq -Z_{\alpha} \text{ , } H_0 \text{ diterima}$$

* Kesimpulan

Pada tingkat Signifikan 0.05 atau 5% , Pernyataan bahwa eksperimen baru dengan ketentuan tidak memiliki Probabilitas 0.8 adalah salah H_0 ditolak