PEMBAHASAN UAS STATISTIKA 2018/2019

-Diperingatkan bahwa jawaban belum tentu sepenuhnya betul-

Selamat belajar!

1.

treatment	2	5	2	4	2
no-treatment	2	1	3	3	

- $\bar{x}_1 = (2+5+2+4+2)/5 = 3$
- $\bar{x}_2 = (2+1+3+3)/4 = 2{,}25$
- $s_1 = \sqrt{\frac{(-1)^2 + 2^2 + (-1)^2 + 1^2 + (-1)^2}{4}} = \sqrt{2} = 1{,}41$
- $s_2 = \sqrt{\frac{(-0{,}25)^2 + (-1{,}25)^2 + 0{,}75^2 + 0{,}75^2}{3}} = \sqrt{0{,}91} = 0{,}95$
- $n_1 = 5$
- $n_2 = 4$

$s_p^2 = \frac{(5-1)2 + (4-1)0{,}91}{5+4-2}$

$s_p^2 = 1{,}53 \Rightarrow s_p = 1{,}24$

.) Statistik uji

$t_{hit} = \frac{\bar{x}_1 - \bar{x}_2}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}} = \frac{3-2{,}25}{1{,}24\sqrt{\frac{1}{5}+\frac{1}{4}}} = \frac{0{,}75}{(1{,}24)(0{,}67)}$

$= \frac{0{,}75}{0{,}83} = 0{,}9$

.) Daerah kritik

H_0 ditolak jika $t_{hit} > t_{0{,}025;7} = 2{,}364$

atau

$-t_{hit} < -t_{0{,}025;7} = -2{,}364$

dengan hipotesa $H_0 : \mu_1 = \mu_2$

$H_1 : \mu_1 \neq \mu_2$

maka H_0 DITERIMA

- Kesimpulan = karena H_0 diterima, berarti hasil dari penggunaan treatment ataupun tidak adalah sama, sehingga serum tidak efektif

2.

Plant	Before	After	d_j	d_j^2
1	30	21	9	81
2	18	19	-1	1
3	32	22	10	100
4	32	25	7	49
5	19	15	4	16
			29	247

- $\bar{d} = \frac{1}{n} \sum_{j=1}^{n} d_j = \frac{1}{5}(29) = 5.8$
- $Sd = \sqrt{\frac{\sum_{j=1}^{n} d_j^2 - \frac{1}{n}\left(\sum_{j=1}^{n} d_j\right)^2}{n-1}}$

$= \sqrt{\frac{247 - \frac{1}{5}(841)}{4}} = \sqrt{\frac{247 - 168,2}{4}} = \sqrt{\frac{78,8}{4}} = \sqrt{19,7} = 4,43$

- $H_0 : \mu_1 = \mu_2 \Leftrightarrow \mu_1 - \mu_2 = 0 \Leftrightarrow \mu_0 = 0$

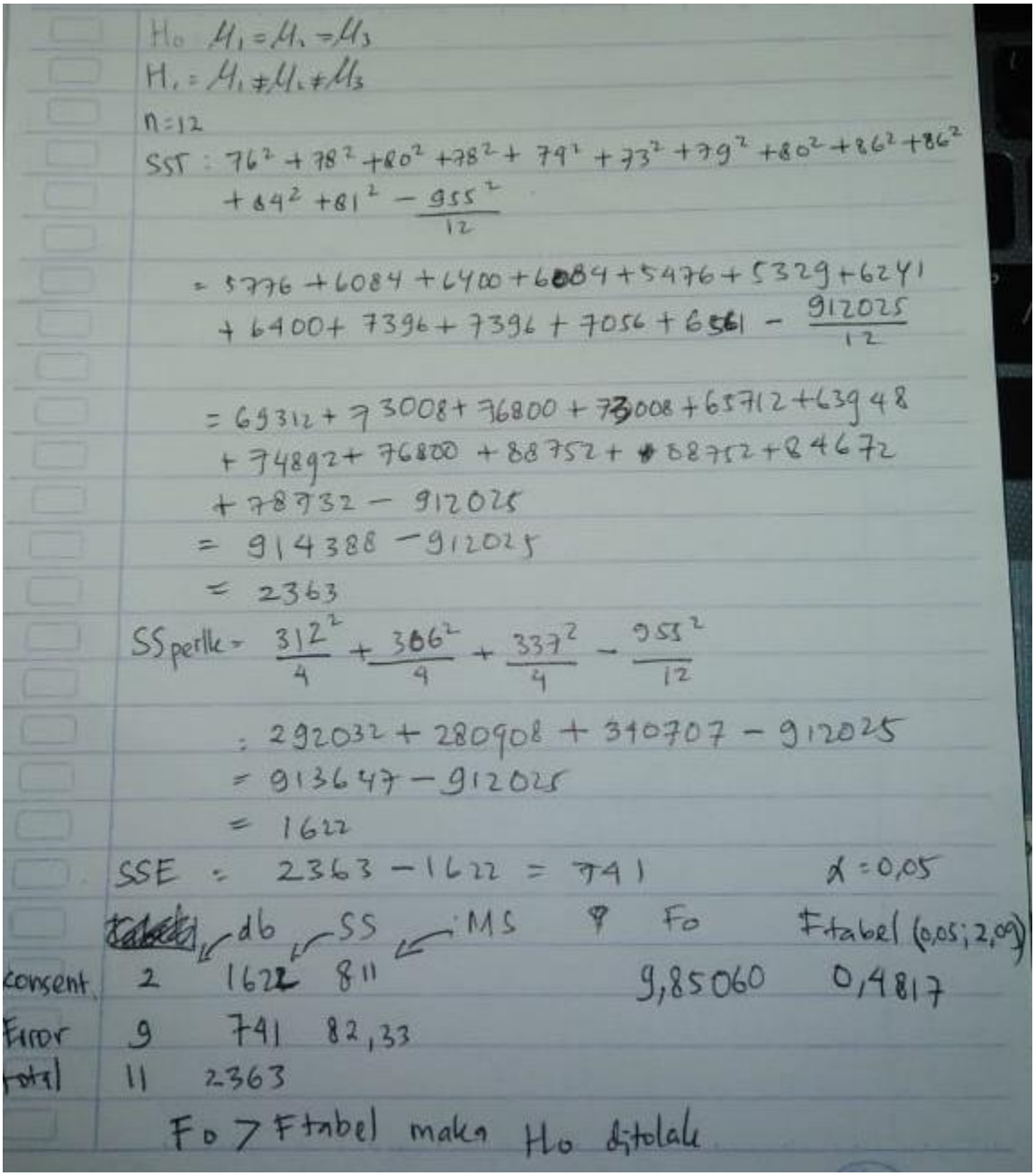
  $H_1 : \mu_1 \neq \mu_2$
- Stat uji $= t_{hit} = \frac{\bar{d}}{Sd/\sqrt{n}} = \frac{5.8}{4,43/\sqrt{5}} = \frac{5,8}{1,98} = 2,929$
- Daerah kritis → H_0 ditolak jika

  $t_{hit} > t_{\alpha/2;\, n-1} = 2,776$ atau

  $t_{hit} < -t_{\alpha/2;\, n-1} = -2,776$

  ↳ $2,929 > 2,776$
- Kesimpulan : H_0 ditolak → Program baru bisa mengurangi rata² kerugian mingguan

3.



$H_0 \quad \mu_1 = \mu_2 = \mu_3$

$H_1 = \mu_1 \neq \mu_2 \neq \mu_3$

$n = 12$

$SST : 76^2 + 78^2 + 80^2 + 78^2 + 79^2 + 73^2 + 79^2 + 80^2 + 86^2 + 86^2 + 84^2 + 81^2 - \frac{955^2}{12}$

$= 5776 + 6084 + 6400 + 6084 + 5476 + 5329 + 6241 + 6400 + 7396 + 7396 + 7056 + 6561 - \frac{912025}{12}$

$= 69312 + 73008 + 76800 + 73008 + 65712 + 63948 + 74892 + 76800 + 88752 + 88752 + 84672 + 78732 - 912025$

$= 914388 - 912025$

$= 2363$

$SS\,perlk = \frac{312^2}{4} + \frac{366^2}{4} + \frac{337^2}{4} - \frac{955^2}{12}$

$= 292032 + 280908 + 340707 - 912025$

$= 913647 - 912025$

$= 1622$

$SSE = 2363 - 1622 = 741 \qquad \alpha = 0,05$

	db	SS	MS	F	Fo	Ftabel (0,05; 2,09)
consent	2	1622	811		9,85060	0,4817
Error	9	741	82,33			
total	11	2363				

Fo > Ftabel maka Ho ditolak

4. Analisis output

↳ Fungsi yg dipanggil adalah lm → linear model (untuk uji regresi dan korelasi)

• Hasil analisis

1) Estimasi model regresi linear

$\hat{Y} = -22,99316 + 1,39567(X_1) + 0,21761(X_2)$

2) Uji F (simultan)

•) $H_0 = \beta_1 = \beta_2 = 0$

H_1 = ada $\beta_i \neq 0$, $i = 1,2$.

n = jml kasus = 10

k = jml variabel independent = 2

•) $F_{hit} = 24,09$

• Ftabel = $F_{\alpha ; \text{jumlah variabel} - 1 ; (n-k-1)}$

$= F_{0,05 ; 2 ; 7} = 4,74$

↳ $24,09 > 4,74 \rightarrow F_{hit} > F_{tabel}$

Kesimpulan = H_0 ditolak → β_1 dan β_2 signifikan secara bersama-sama

3) Koefisien determinasi (R^2)

$R^2 = 0,8732 \rightarrow$ 87,32 % dari berat hewan (Y) dipenuhi secara bersama-sama oleh variabel X_1 dan X_2.

Sisanya (12,68 %) dipengaruhi faktor lain

4) Uji korelasi (parsial)

• Uji terhadap X_1

$H_0 = \rho = 0$

$H_1 = \rho \neq 0$

$t_{hit} = 2,396$

$t_{tabel} = t_{0,025 ; 7} = 2,364$

$t_{hit} > 2,364$

↳ H_0 ditolak → ada korelasi antara X_1 dengan Y

- Uji terhadap x_2

$H_0 = \rho = 0$

$H_1 = \rho \neq 0$

$t_{hit} = 3,767$

$t_{tabel} = t_{0,025;17}$

$= 2,364$

$t_{hit} > 2,364$

↳ H_0 ditolak → ada korelasi antara x_2 dengan y

- Prediksi berat hewan bila initial weight = 35 kg dan makanan yg diberikan = 250 kg

$x_1 = 35$

$x_2 = 250$

$\hat{Y} = -22,99316 + 1,39567(x_1) + 0,21761(x_2)$

$= -22,99316 + 1,39567(35) + 0,21761(250)$

$= 80,25779 \approx 81$

↳ pembulatan ke atas