

Lampiran 1. Data Penelitian

**Data Hasil *Power Otot Tungkai* (X_1), *Kelentukan Otot Pinggang* (X_2) dan
Hasil Smash Bola Voli (Y)**

No	X_1	X_2	Y
1	58	32	4
2	57	27	4
3	66	31	5
4	70	43	8
5	55	41	4
6	47	25	1
7	54	37	6
8	39	32	5
9	34	31	6
10	59	36	5
11	29	30	3
12	42	34	3
13	53	35	3
14	48	39	5
15	53	35	5
16	57	39	5
17	56	30	5
18	68	25	5
19	56	44	9
20	55	31	6
21	48	27	6
22	46	29	5
23	60	34	5
24	35	28	3
25	45	34	5
26	64	44	9
27	51	42	3
28	47	38	4
29	75	40	9
30	77	46	9
	1604	1039.5	155

Lampiran 2. Data Distribusi Frekuensi X_1 , X_2 dan Y

1. Variabel *Power* Otot Tungkai

a. Rentang : Data terbesar – data terkecil

$$: 77 - 29$$

$$: 48$$

b. Kelas Interval : $1 + 3,3 \log n$

$$: 1 + 3,3 \log 30$$

$$: 1 + 3,3 (1,48)$$

$$: 1 + 4,87$$

$$: 5,87 \text{ dibulatkan } 6$$

c. Panjang Kelas : $\frac{\text{Rentang}}{\text{Kelas Interval}}$

$$: \frac{48}{6}$$

$$: 8$$

2. Variabel Kelentukan Otot Pinggang

a. Rentang Kelas : Data terbesar – data terkecil

$$: 46 - 22 = 24$$

b. Kelas Interval : $1 + 3,3 \log n$

$$: 1 + 3,3 \log 30$$

$$: 1 + 3,3 (1,48)$$

$$: 1 + 4,87$$

$$: 5,87 \text{ dibulatkan } 6$$

c. Panjang Kelas : Rentang

Kelas Interval

$$: \frac{24}{6}$$

: **4**

3. Variabel Hasil *Smash* Bola Voli

a. Rentang : Data terbesar – data terkecil

$$: 9 - 1$$

: **8**

b. Kelas Interval : $1 + 3,3 \log n$

$$: 1 + 3,3 \log 30$$

$$: 1 + 3,3 (1,48)$$

$$: 1 + 4,87$$

: **5,87** dibulatkan **6**

c. Panjang Kelas : $\frac{\text{Rentang}}{\text{Kelas Interval}}$

$$: \frac{8}{6}$$

: **1.3** dibulatkan menjadi **1**

Lampiran 3. Data Perhitungan Korelasi dan Regresi

Data Perhitungan Korelasi dan Regresi

No	X ₁	X ₂	Y	X ₁ ²	X ₂ ²	Y ²	X ₁ Y	X ₂ Y	X ₁ X ₂
1	58	32	4	3364	1043	16	232	129	1873
2	57	27	4	3249	729	16	228	108	1539
3	66	31	5	4356	949	25	330	154	2033
4	70	43	8	4900	1858	64	560	345	3017
5	55	41	4	3025	1640	16	220	162	2228
6	47	25	1	2209	625	1	47	25	1175
7	54	37	6	2916	1399	36	324	224	2020
8	39	32	5	1521	1011	25	195	159	1240
9	34	31	6	1156	973	36	204	187	1061
10	59	36	5	3481	1303	25	295	181	2130
11	29	30	3	841	900	9	87	90	870
12	42	34	3	1764	1142	9	126	101	1420
13	53	35	3	2809	1190	9	159	104	1829
14	48	39	5	2304	1490	25	240	193	1853
15	53	35	5	2809	1225	25	265	175	1855
16	57	39	5	3249	1544	25	285	197	2240
17	56	30	5	3136	882	25	280	149	1663
18	68	25	5	4624	635	25	340	126	1714
19	56	44	9	3136	1936	81	504	396	2464
20	55	31	6	3025	980	36	330	188	1722
21	48	27	6	2304	729	36	288	162	1296
22	46	29	5	2116	841	25	230	145	1334
23	60	34	5	3600	1170	25	300	171	2052
24	35	28	3	1225	762	9	105	83	966
25	45	34	5	2025	1170	25	225	171	1539
26	64	44	9	4096	1936	81	576	396	2816
27	51	42	3	2601	1798	9	153	127	2162
28	47	38	4	2209	1475	16	188	154	1805
29	75	40	9	5625	1608	81	675	361	3008
30	77	46	9	5929	2116	81	693	414	3542
	1604	1039.5	155	89604	37059	917	8684	5575	56463

Lampiran 4. Perhitungan rata-rata, varians *Power* Otot Tungkai, Kelentukan Otot Pinggang dan Hasil *Smash* Bola Voli

1. Variabel *Power* Otot Tungkai (X_1)

Diketahui : $\sum X_1 = 1604$ $\sum X_1^2 = 89604$ $n = 30$

a. Rata-rata = Rata-rata $X_1 = \frac{\sum X_1}{n}$

$$= 1604/30$$

$$= 53.47$$

b. Varians

$$= S^2 = \frac{n \sum X_1^2 - (\sum X_1)^2}{n(n-1)}$$

c.

$$= S^2 = \frac{30 (89604) - (1604)^2}{30(30 - 1)}$$

$$= S^2 = \frac{2688120 - 2572816}{870}$$

$$= S^2 = 132.53$$

Simpangan baku

$$= S = \sqrt{132.53}$$

$$S = 11.51$$

2. Variabel Kelentukan Otot Pinggang

Diketahui : $\Sigma X_2 = 1039.5$ $\Sigma X_2^2 = 37059$ $n = 30$

a. Rata-rata X_2 $= \frac{\Sigma X_2}{n}$

$$= \frac{1039,5}{30}$$

$$= 34.65$$

b. Simpangan baku $= S^2 = \frac{n \Sigma X_2^2 - (\Sigma X_2)^2}{n(n-1)}$

$$S^2 = \frac{30(37059) - (1039.5)^2}{30(30 - 1)}$$

$$S^2 = \frac{31209.75}{870}$$

$$S^2 = 35.87$$

c. Varians $= S = \sqrt{35.87}$

$$S = 5.99$$

3. Variabel Hasil *Smash* Bola Voli

Diketahui : $\Sigma Y = 155$ $\Sigma Y^2 = 917$ $n = 30$

a. Rata-rata Y $= \frac{\Sigma Y}{n}$

$$= \frac{155}{30}$$

$$= 5.2$$

b. Simpangan baku $= S^2 = \frac{n \Sigma Y^2 - (\Sigma Y)^2}{n(n-1)}$

$$S^2 = \frac{30(917) - (155)^2}{30(30-1)}$$

$$S^2 = \frac{3485}{870}$$

$$S^2 = 4.01$$

c. Varians $= S = \sqrt{4.01}$

$$S = 2$$



Lampiran 5. Mencari Persamaan Regresi

1. Regresi y atas X_1

$$\text{Diketahui : } \sum X_1 = 1604 \quad \sum Y = 155$$

$$\sum X_1^2 = 89604 \quad \sum Y^2 = 917$$

$$\sum X_1 Y = 8684 \quad n = 30$$

Mencari a :

$$\begin{aligned} a &= \frac{(\sum Y)(\sum X_1^2) - (\sum X_1)(\sum X_1 Y)}{n \sum X_1^2 - (\sum X_1)^2} \\ &= \frac{(155)(89604) - (1604)(8684)}{30(89604) - (1604)^2} \end{aligned}$$

$$= \frac{-40516}{115304}$$

$$= -0.35$$

$$b = \frac{n(\sum X_1 Y) - (\sum X_1)(\sum Y)}{n \sum X_1^2 - (\sum X_1)^2}$$

$$= \frac{30(8684) - (1604)(155)}{30(89604) - (1604)^2}$$

$$= \frac{11900}{115304}$$

$$= 0.10$$

Jadi persamaan regresi y dengan X_1 : $\hat{Y} = -0.35 + 0.10X_1$

2. Regresi Y atas X_2

Diketahui :

$$\begin{aligned} \sum X_2 &= 1309.5 & \sum Y &= 155 \\ \sum X_2^2 &= 37059 & \sum Y^2 &= 917 \\ \sum X_2 Y &= 5575 & n &= 30 \end{aligned}$$

Mencari a :

$$\begin{aligned} a &= \frac{(\sum Y)(\sum X_2^2) - (\sum X_2)(\sum X_2 Y)}{n \sum X_2^2 - (\sum X_2)^2} \\ &= \frac{(155)(37059) - (1309.5)(5575)}{30(37059) - (1309.5)^2} \\ &= \frac{-51415}{312020.85} \\ &= -1.65 \\ b &= \frac{n(\sum X_2 Y) - (\sum X_2)(\sum Y)}{n \sum X_2^2 - (\sum X_2)^2} \\ &= \frac{30(5575) - (1309.5)(155)}{30(37059) - (1309.5)^2} \\ &= \frac{6136.5}{312020.85} \\ &= 0.20 \end{aligned}$$

Jadi persamaan regresi Y terhadap X_2 adalah $\hat{Y} = -1.65 + 0.20 X_2$

3. Regresi Ganda Y atas X_1 dan X_2

Dicari dengan rumus

$$a = \tilde{y} - b_1\tilde{x}_1 - b_2\tilde{x}_2$$

$$b_1 = \frac{(\sum x_2^2)(\sum x_1 y) - (\sum x_1 x_2)(\sum x_2 y)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2}$$

$$b_2 = \frac{(\sum x_1^2)(\sum x_2 y) - (\sum x_1 x_2)(\sum x_1 y)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2}$$

Dimana :

$$\Sigma y^2 = \Sigma Y^2 - \frac{(\Sigma Y)^2}{n}$$

$$\Sigma x_1^2 = \Sigma X_1^2 - \frac{(\Sigma x_1)^2}{n}$$

$$\Sigma x_2^2 = \Sigma X_2^2 - \frac{(\Sigma x_2)^2}{n}$$

$$\Sigma x_1 y = \Sigma X_1 Y - \frac{(\Sigma x_1)(\Sigma y)}{n}$$

$$\Sigma x_2 y = \Sigma X_2 Y - \frac{(\Sigma x_2)(\Sigma y)}{n}$$

$$\Sigma x_1 x_2 = \Sigma X_1 X_2 - \frac{(\Sigma x_1)(\Sigma x_2)}{n}$$

Jadi :

$$\Sigma y^2 = \Sigma Y^2 - \frac{(\Sigma Y)^2}{n}$$

$$= 917 - \frac{(155)^2}{30}$$

$$= 917 - 800.83$$

$$= 116$$

$$\begin{aligned}\Sigma X_1^2 &= \Sigma X_1^2 - \frac{(\Sigma X_1)^2}{n} \\ &= 89604 - \frac{(1604)^2}{30} \\ &= 89604 - 85760.5 \\ &= 3843\end{aligned}$$

$$\begin{aligned}\Sigma X_2^2 &= \Sigma X_2^2 - \frac{(\Sigma X_2)^2}{n} \\ &= 37059 - \frac{(1309.5)^2}{30} \\ &= 37059 - 3608.17 \\ &= 1040\end{aligned}$$

$$\begin{aligned}\Sigma X_1Y &= \Sigma X_1Y - \frac{\Sigma X_1 \Sigma Y}{n} \\ &= 8684 - \frac{(1604)(155)}{30} \\ &= 8684 - 8287,3 \\ &= 397\end{aligned}$$

$$\begin{aligned}\Sigma X_2Y &= \Sigma X_2Y - \frac{\Sigma X_2 \Sigma Y}{n} \\ &= 5575 - \frac{(1309.5)(155)}{30}\end{aligned}$$

$$= 5575 - 5370.75$$

$$= 204.55$$

$$\Sigma X_1 X_2 = \Sigma X_1 X_2 - \frac{\Sigma X_1 \Sigma X_2}{n}$$

$$= 56463.2 - \frac{(1604)(1309.5)}{30}$$

$$= 56463.2 - 55578.6$$

$$= 884.6$$

Diketahui:

$$\Sigma x_1^2 = 3843.47$$

$$\Sigma x_1 y = 396.69$$

$$\Sigma x_2^2 = 1040.09$$

$$\Sigma x_2 y = 204.55$$

$$\Sigma y^2 = 116.17$$

$$\Sigma x_1 x_2 = 884.6$$

$$b_1 = \frac{(\Sigma x_2^2)(\Sigma x_1 y) - (\Sigma x_1 x_2)(\Sigma x_2 y)}{(\Sigma x_1^2)(\Sigma x_2^2) - (\Sigma x_1 x_2)^2}$$

$$= \frac{(1040.09)(396.67) - (884.6)(204.55)}{(3843.47)(1040.09) - (884.6)^2}$$

$$= \frac{412571 - 180945}{3997570 - 782517}$$

$$= \frac{231626.1}{3215053}$$

$$= 0.07$$

$$\begin{aligned}
 b_2 &= \frac{(\sum x_1^2)(\sum x_1 y) - (\sum x_1 x_2)(\sum x_1 y)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2} \\
 &= \frac{(3843.47)(204.55) - (884.6)(396.67)}{(3843.47)(1040.09) - (884.6)^2} \\
 &= \frac{786181 - 350891}{3997570 - 782517} \\
 &= \frac{3997570}{782517} \\
 &= 0.14
 \end{aligned}$$

$$\begin{aligned}
 a &= \frac{\sum Y - (b_1 \times \sum X_1) - (b_2 \times \sum X_2)}{n} \\
 &= \frac{155 - (0.07 \times 1604) - (0.14 \times 1309.5)}{30} \\
 &= \frac{155 - 115.56 - 140.74}{30} \\
 &= -3.38
 \end{aligned}$$

Jadi persamaan regresi ganda Y atas X_1 dan X_2 adalah :

$$\hat{Y} = -3.38 + 0,07 X_1 + 0,14 X_2$$

Lampiran 6. Perhitungan Kofisien korelasi

1. Korelasi X_1 Terhadap Y

a. Koefisien Korelasi r_{y_1}

$$\begin{aligned}
 r &= \frac{n(\sum x_1 y) - (\sum x_1)(\sum y)}{\sqrt{[n(\sum x_1^2) - (\sum x_1)^2][n(\sum y^2) - (\sum y)^2]}} \\
 &= \frac{30(8684) - (1604)(155)}{\sqrt{[30(89604) - (1604)^2][30(917) - (155)^2]}} \\
 &= \frac{11900}{\sqrt{\{115304\} \{3485\}}} \\
 &= \frac{11900}{20045.81} \\
 &= 0,594
 \end{aligned}$$

b. uji keberartian koefisien korelasi $r_{x_1 y}$

$$\begin{aligned}
 t &= \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \\
 &= \frac{0,59\sqrt{30-2}}{\sqrt{1-(0,59)^2}} \\
 &= \frac{3.14}{0.80} \\
 &= 3.90
 \end{aligned}$$

$$\text{Tabel dk} = n - 2$$

$$= 30 - 2$$

$$= 28$$

$$T \text{ tabel} = dk : 0.05 \alpha$$

$$= 28 : 0.05 \alpha$$

$$= 28 : 0,05$$

$$= 1,701$$

Berarti nilai t_{tabel} dengan $\alpha = 0,05$ dan $dk = 28$ diperoleh sebesar 1.701 dan $t_{\text{hitung}} = 3.90$. Karena nilai $t_{\text{hitung}} = 3.90 > t_{\text{tabel}} = 1.701$, maka dengan demikian H_0 di tolak, dan H_a diterima. Ini berarti terhadap hubungan antara *power* otot tungkai dengan hasil *smash* bola voli.

2. Korelasi X_2 Terhadap Y

a. Koefisien korelasi r_{x_2y}

$$\begin{aligned} r &= \frac{n(\sum x_1 y) - (\sum x_1)(\sum y)}{\sqrt{[n(\sum x_1^2) - (\sum x_1)^2][n(\sum y^2) - (\sum y)^2]}} \\ &= \frac{30(37059) - (1039.5)(155)}{\sqrt{[30(37059) - (1039.5)^2][30(917) - (155)^2]}} \\ &= \frac{6136.5}{\sqrt{\{31202.85\} \{3485\}}} \\ &= \frac{6136.5}{10427.94} \\ &= 0,588 \end{aligned}$$

b. Uji keberartian koefisien korelasi r_{x_2y}

$$\begin{aligned}
 t &= \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \\
 &= \frac{0,59\sqrt{30-2}}{\sqrt{1-(0,59)^2}} \\
 &= \frac{3,11}{0,81} \\
 &= 3,85
 \end{aligned}$$

$$\begin{aligned}
 \text{Tabel dk} &= n - 2 \\
 &= 30 - 2 \\
 &= 28
 \end{aligned}$$

$$\begin{aligned}
 \text{T tabel} &= dk : 0,05 \alpha \\
 &= 28 : 0,05 \alpha \\
 &= 28 : 0,05 \\
 &= 1,701
 \end{aligned}$$

Berarti nilai t_{tabel} dengan $\alpha = 0,05$ dan $dk = 28$ diperoleh sebesar 1.701 dan $t_{\text{hitung}} = 3,85$. Karena nilai $t_{\text{hitung}} = 3,85 > t_{\text{tabel}} = 1,701$, maka dengan demikian H_0 di tolak, dan H_a diterima. Ini berarti terhadap hubungan antara kelentukan otot pinggang dengan hasil *smash* bola voli.

3. Mencari koefisien korelasi ganda (R)

$$\begin{aligned}
 \text{a. } R &= \sqrt{\frac{r^2_{yx_1} + r^2_{yx_2} - 2r^2_{yx_1}r^2_{yx_2}r^2_{x_1x_2}}{1 - r^2_{x_1x_2}}} \\
 &= \sqrt{\frac{0.352 + 0.346 - 0.047}{1 - 0.194}} \\
 &= \sqrt{\frac{0.652}{0.806}} \\
 &= \sqrt{0.808} \\
 &= 0.90
 \end{aligned}$$

b. Uji keberartian koefisien korelasi ganda

$$\begin{aligned}
 FH &= \frac{R^2 / k}{(1 - (R^2)) / (n - k - 1)} \\
 &= \frac{(0,90)^2 / 2}{(1 - (0,90)^2) / (30 - 2 - 1)} \\
 &= \frac{0,81 / 2}{1 - 0,81 / (27)} \\
 &= \frac{0,405}{0,007} \\
 &= 57,31
 \end{aligned}$$

F_{tabel} dapat dicari dengan cara melihat daftar distribusi F dengan cacah predictor = z sebagai pembilang dan $(n - k - 1) = (30 - 2 - 1) = 27$ sebagai

penyebut didapat $F_{hitung} = 57.31 > F_{tabel} = 3,34$, maka koefisien korelasi ganda $r_{xy}^{1-2} = 0,90$ adalah signifikan.



Lampiran 7. Foto Penelitian









