# Analisis Regresi

**Bagian 2**

# Uji Keberartian Koef. Regresi

1. Susun hipotesis

$$H_0 : \beta = 0$$
$$H_1 : \beta \neq 0$$

2. Pilih tingkat signifikansi
3. Kesimpulan : tolak Ho jika t> t tabel

$$t = \frac{b}{s_b}$$

$$s_{y.x} = \sqrt{\frac{\mathrm{JK_S}}{\mathrm{n-2}}}$$

$$s_b = \sqrt{\frac{s_{y.x}^2}{c}}, \quad c = \sum x^2 - \frac{\left(\sum x\right)^2}{n}$$

# Contoh YII

1. Susun hipotesis

$$H_0 : \beta = 0$$
$$H_1 : \beta \neq 0$$

2. Pilih tingkat signifikansi $\alpha$

3. Kesimpulan : tolak Ho jika t> t tabel=t ($\alpha$/2, n-2)

$$b = 0.8972$$

$$s_b = 0.166504$$

$$t = \frac{0.8972}{0.166504} = 5.388$$

Karena t=5.388>2.228 maka H0 ditolak jadi koefisien b berarti. 2.228 diperoleh dari tabel t dengan t(0.025,10)

# Dengan spss..

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .862[a] | .744 | .718 | 4.319 |

a. Predictors: (Constant), matematik

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 541.693 | 1 | 541.693 | 29.036 | .000[a] |
| | Residual | 186.557 | 10 | 18.656 | | |
| | Total | 728.250 | 11 | | | |

a. Predictors: (Constant), matematik

b. Dependent Variable: fisika

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 29.529 | 9.311 | | 3.171 | .010 | | |
| | matematik | .897 | .167 | .862 | 5.389 | .000 | 1.000 | 1.000 |

a. Dependent Variable: fisika

# Contoh 3

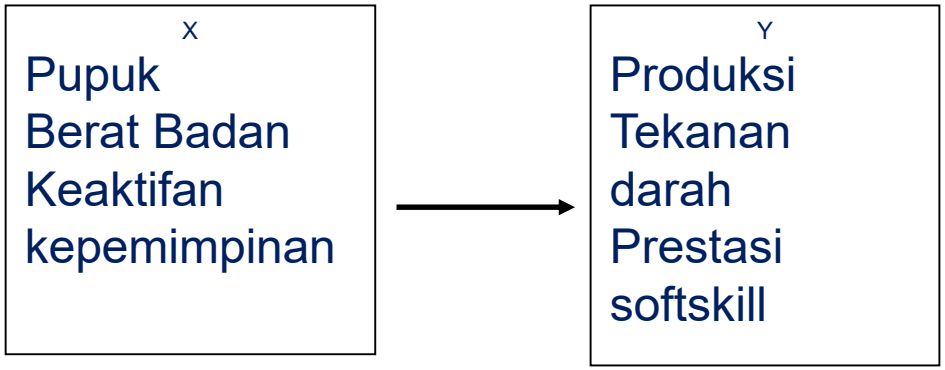
- Lakukan analisis regresi linier sederhana pada data berikut:

| cerah (jam) | 1.9 | 2.5 | 3.2 | 3.8 | 4.7 | 5.5 | 5.9 | 7.2 |
|---|---|---|---|---|---|---|---|---|
| tiket terjual (dalam 100 ex) | 22 | 33 | 30 | 42 | 38 | 49 | 42 | 55 |

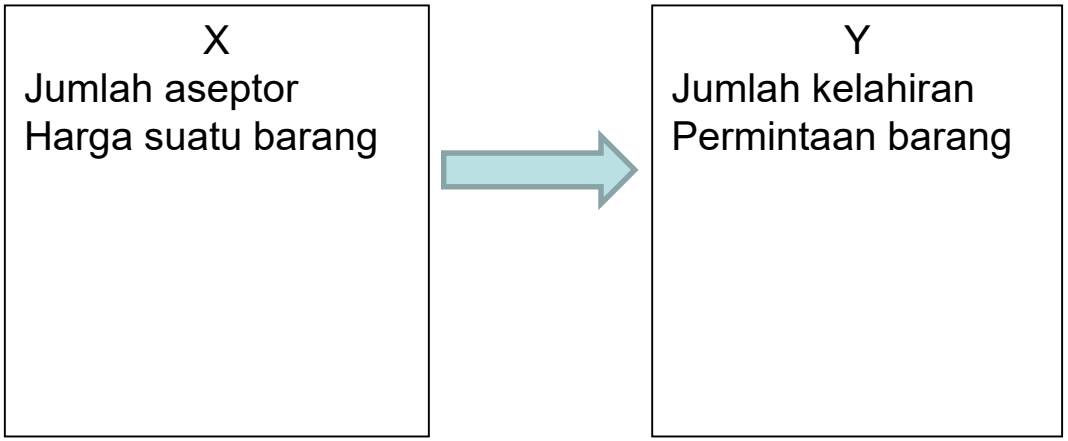
# korelasi

**Pada regresi linier sederhana**

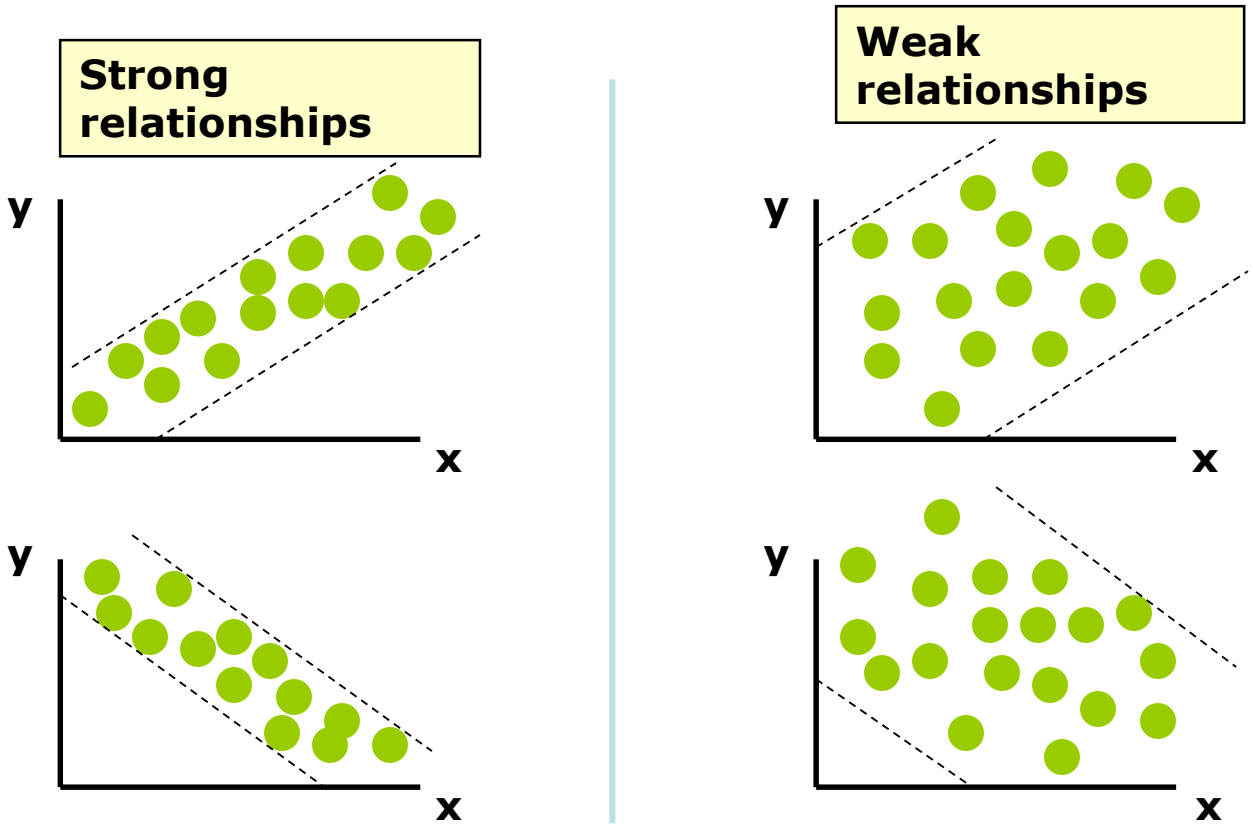
# Ilustrasi hubungan positif



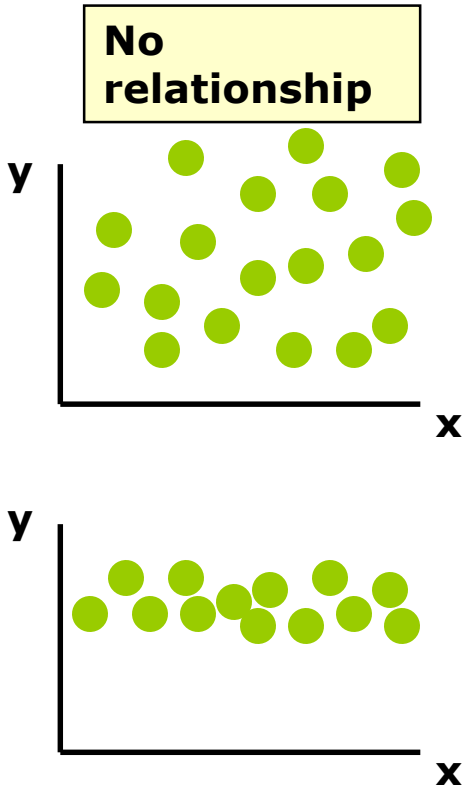
# Ilustrasi hubungan negatif



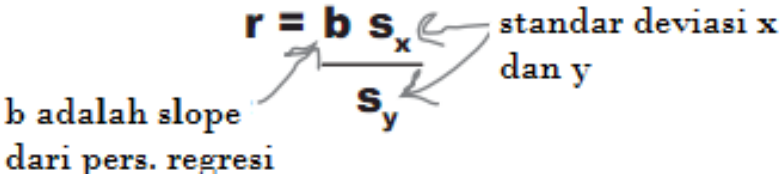
# Scatter Plot Examples



# Scatter Plot Examples



# Rumus r




$$R^2 = \frac{JK_R}{JK_T} = \frac{\text{Jumlah kuadrat yang dijelaskan oleh regresi}}{\text{Jumlah kuadrat total}}$$

**Catatan:** pada regresi sederhana (satu variabel bebas) koefisien determinasi dapat dinyatakan dengan dengan: $R^2 = r^2$

$R^2$ = Koefisien Determinasi

r = Koefisien Korelasi Sederhana

Dapatkah anda turunkan rumus r dengan JK?

Kembali ke contoh 3.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| cerah (jam) | 1.9 | 2.5 | 3.2 | 3.8 | 4.7 | 5.5 | 5.9 | 7.2 |
| tiket terjual (dalam 100 ex) | 22 | 33 | 30 | 42 | 38 | 49 | 42 | 55 |

1. Cari r dari tabel di bawah ini !
2. Tentukan jenis korelasinya !

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 655.511 | 1 | 655.511 | 31.373 | .001[a] |
| | Residual | 125.364 | 6 | 20.894 | | |
| | Total | 780.875 | 7 | | | |

a. Predictors: (Constant), X

b. Dependent Variable: Y

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 15.728 | 4.437 | | 3.545 | .012 |
| | X | 5.336 | .953 | .916 | 5.601 | .001 |

a. Dependent Variable: Y

# Kembali ke contoh 3

Jadi dapat dilihat

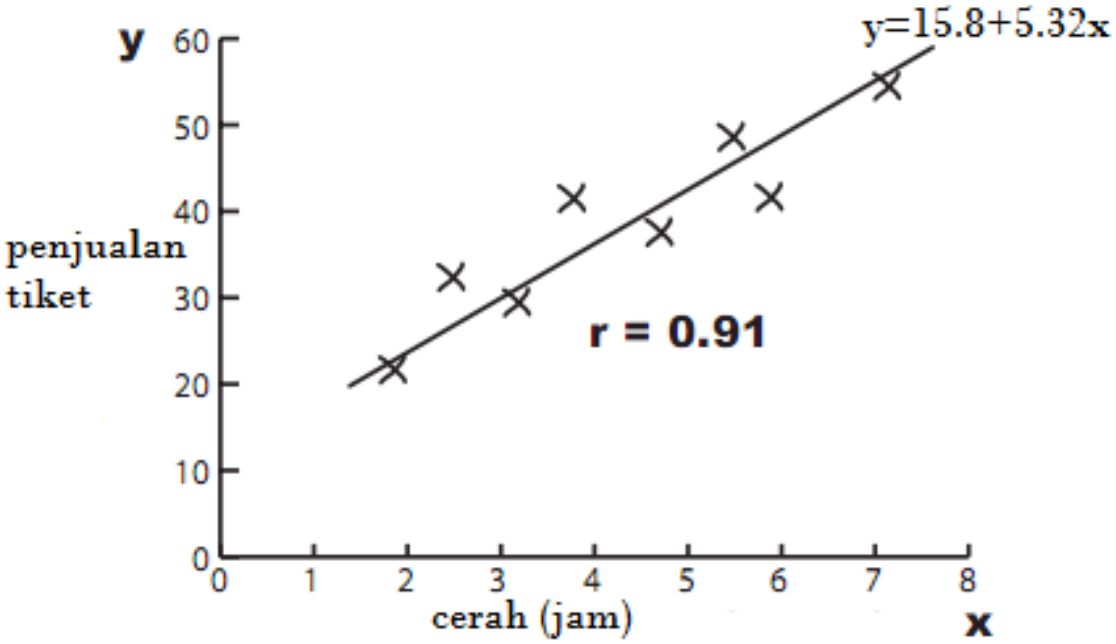
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .916[a] | .839 | .813 | 4.57099 |

a. Predictors: (Constant), X

$$r = bs_x / s_y$$

$$= 5.32 \times 1.81 / 10.56$$

$$= 0.91$$



# Kesalahan Baku Taksiran
## (Standard Error of Estimate)

- Merupakan ukuran variabilitas antara Y dengan nilai Y prediksi

$$s_{y.x} = \sqrt{\frac{JK_S}{n-2}}$$

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 655.511 | 1 | 655.511 | 31.373 | .001[a] |
| | Residual | 125.364 | 6 | 20.894 | | |
| | Total | 780.875 | 7 | | | |

a. Predictors: (Constant), X

b. Dependent Variable: Y

- Contoh yll:

$$JK_S = 125.364$$

$$s_{y.x} = \sqrt{\frac{125.364}{8-2}} = 4.57$$

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .916[a] | .839 | .813 | 4.57099 |

a. Predictors: (Constant), X

# Kesalahan Baku Koef. Regresi

definisi $$s_b = \sqrt{\frac{s_{y.x}^2}{c}}, \quad c = \sum x^2 - \frac{\left(\sum x\right)^2}{n}$$

Contoh 3

| x | y | $x^2$ |
|---|---|---|
| 1.9 | 22 | 3.61 |
| 2.5 | 33 | 6.25 |
| 3.2 | 30 | 10.24 |
| 3.8 | 42 | 14.44 |
| 4.7 | 38 | 22.09 |
| 5.5 | 49 | 30.25 |
| 5.9 | 42 | 34.81 |
| 7.2 | 55 | 51.84 |
| $\Sigma x=34.7$ | | $\Sigma x^2=173.53$ |
| $(\Sigma x)^2=1204.09$ | | |

Contoh yll

$$\sum x^2 = 173.53, \quad \left(\sum x\right)^2 = (34.7)^2 = 1204.09$$

$$S_{y.x} = 4.57 \Rightarrow S_{y.x}^2 = 20.8849$$

$$s_b = \sqrt{\frac{s_{y.x}^2}{c}}, \quad c = \sum x^2 - \frac{\left(\sum x\right)^2}{n} = 173.53 - \frac{1204.09}{8}$$

$$= 23.01875$$

$$s_b = \sqrt{\frac{s_{y.x}^2}{c}} = \sqrt{\frac{20.8849}{23.01875}} = 0.952523$$

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 15.728 | 4.437 | | 3.545 | .012 |
| | X | 5.336 | .953 | .916 | 5.601 | .001 |

a. Dependent Variable: Y