Statistics

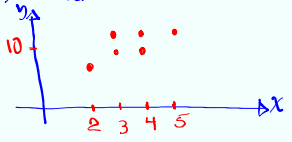
Lecture 16

Feb 19-8:47 AM

Consider the Sample below

x	y
4	10
5	13
3	10
2	8
4	12
3	12

1) Scatter Plot



2) $x \to L1$, $y \to L2$

Use [2-Var Stats] with L1 & L2 to find

$\Sigma x = 21$ $\Sigma y = 65$

$\Sigma x^2 = 79$ $\Sigma y^2 = 721$

$n = 6$ $\Sigma xy = 235$

3) Use [LinReg(a+bx)] with L1 & L2 to find

$a = 6.061 \approx 6.1$

$b = 1.369 \approx 1.4$

$\to [y \approx 6.1 + 1.4x]$

$r^2 = .608 \approx 61\%$ Coef. of determination

61% of Y-values are explained by x-values

$r = .779$

Linear Correlation Coef.

Since r is close to 1, Linear Correlation appears to be significant.

Sep 24-8:54 AM

Predict y when $x = 4$

1) Assume r is Significant

Use Regression line

$y = 6.1 + 1.4(4) = 11.7 \approx \boxed{12}$

2) Assume r is not Significant.

Use $\bar{y}$

VARS

5: Statistics

5: $\bar{y}$ Enter

$\bar{y} = \frac{\Sigma y}{n} = \frac{65}{6} \approx 11$

$10.8\overline{3} \approx 11$

Sep 24-9:08 AM

Exam 1	Exam 2
75	83
80	90
65	55
90	95
90	100

$x = 11$ $y = 12$

1) $\Sigma x = 400$ $\Sigma y = 423$

$\Sigma x^2 = 32450$ $\Sigma y^2 = 37039$

$n = 5$ $\Sigma xy = 34550$

2) $a \approx -41.622 \approx -42$

$b \approx 1.578 \approx 2$

$\boxed{y \approx -42 + 2x}$

$r^2 \approx .894$

Coef. of determination

$r^2 \approx 89\%$

89% of exam 2 Scores are explained by exam 1 Scores.

$r \approx .945$

Linear Correlation Coefficient.

r is close to 1

So linear Correlation appears to be Significant

Sep 24-9:13 AM

Predict exam 2 score for someone who got 85 on exam 1.

1) Assume r is significant $\quad \hat{y} \approx -42 + 2(85)$

use Regression line $\quad \approx 128$

2) Assume r is not significant.

use $\bar{y}$ $\quad$ VARS 5:

$\approx 84.6 \approx \boxed{85}$ $\quad$ 5: $\quad$ Enter

Sep 24-9:24 AM

Intro. to Probability $\quad$ SG 10

$E \rightarrow$ Event (outcome)

$P(E) \rightarrow$ Prob. that E happens

$$P(E) = \frac{\text{Total \# of all desired outcomes}}{\text{Total \# of all outcomes}}$$

25 Students

15 Females

10 Males

Randomly Select one student

$$P(\text{one female}) = \frac{15 \text{ Females}}{25 \text{ Students}} = \boxed{\frac{3}{5}} = \boxed{.6}$$

Sep 24-9:28 AM

A box has 3 red, 6 white, and 11 blue balls.

Randomly select one ball

$P(\text{Red}) = \frac{3 \text{ Red}}{20 \text{ balls}} = \frac{3}{20} = .15$

$P(\text{Red or white}) = \frac{9 \text{ Red or white}}{20 \text{ balls}} = \frac{9}{20} = .45$

$P(\text{Red and Blue}) = \frac{0 \text{ Red and Blue}}{20 \text{ balls}} = \frac{0}{20} = \boxed{0}$

Impossible

Sep 24-9:34 AM

A full deck of playing cards has 52 cards

26 Red, 12 face cards, 4 Aces.

Draw one card randomly

1) $P(\text{Ace}) = \frac{4}{52} = \boxed{\frac{1}{13}} = \boxed{.077}$

2) $P(\text{Face}) = \frac{12}{52} = \boxed{\frac{3}{13}} = \boxed{.231}$

3) $P(\text{Red Ace}) = \frac{2}{52} = \boxed{\frac{1}{26}}$

4) $P(\text{Red face}) = \frac{6}{52} = \boxed{\frac{3}{26}}$

5) $P(\text{Red or Black}) = \frac{52}{52} = 1$

Sure event

Sep 24-9:40 AM