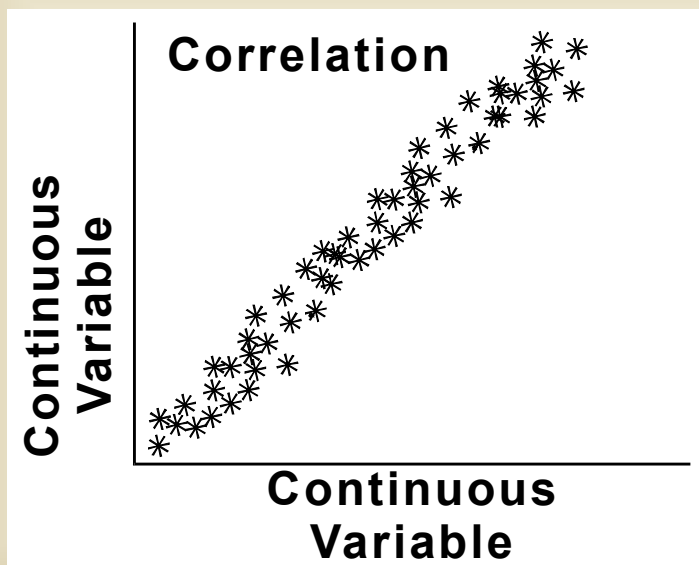


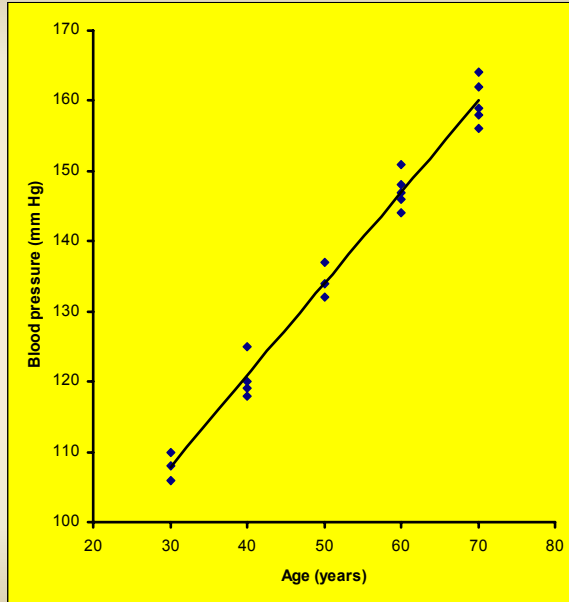
ضریب همبستگی

Correlation Coefficient

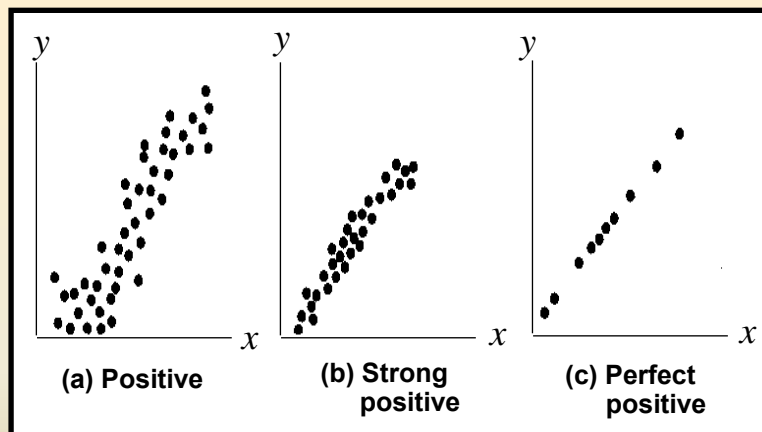


Scatter Plot نمودار پراکنش

Age year	B.P. mm Hg
30	108
30	110
30	106
40	125
40	120
40	118
40	119
50	132
50	137
50	134
60	148
60	151
60	146
60	147
60	144
70	162
70	156
70	164
70	158
70	159

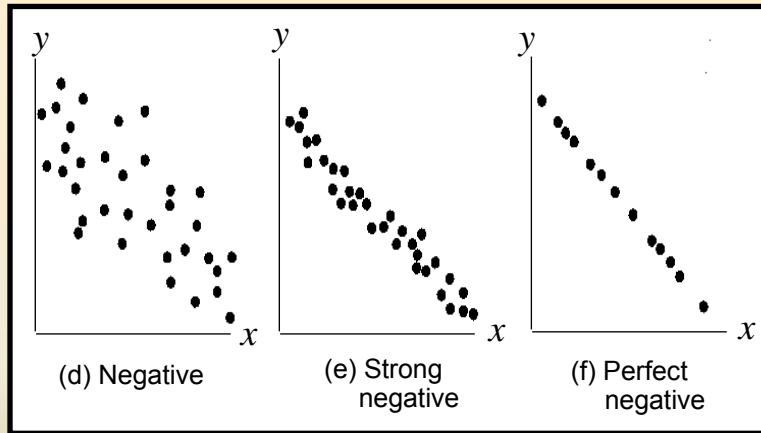


Positive Linear Correlation



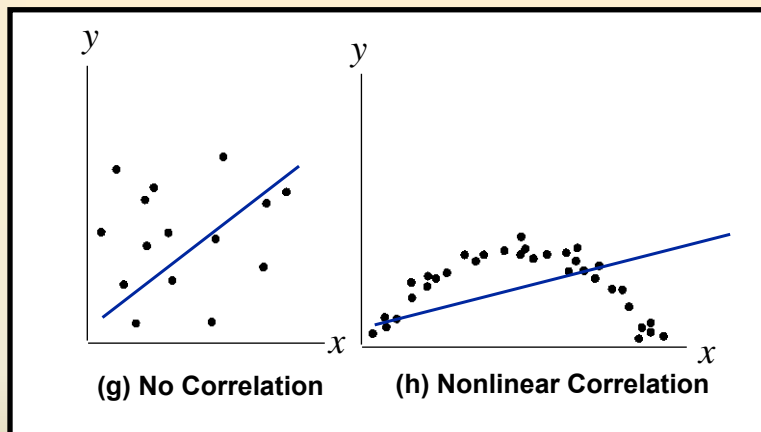
Scatter Plots

Negative Linear Correlation



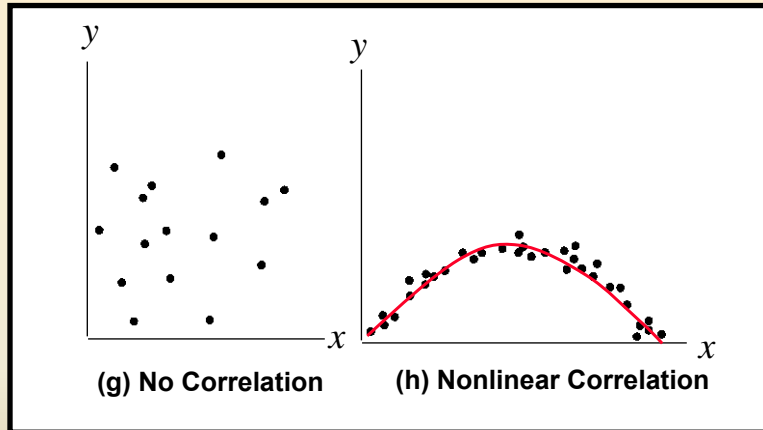
Scatter Plots

No Linear Correlation



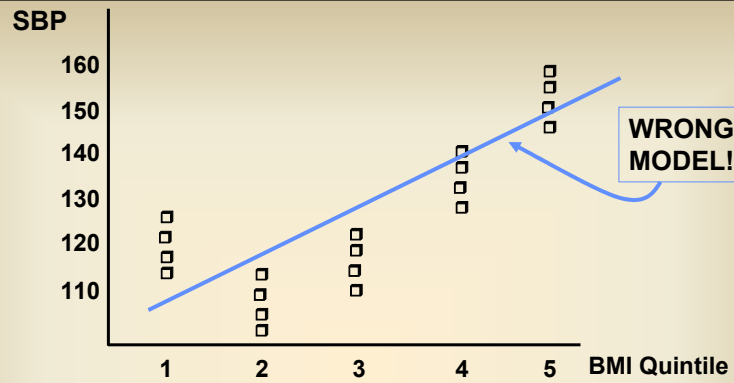
Scatter Plots

No Linear Correlation

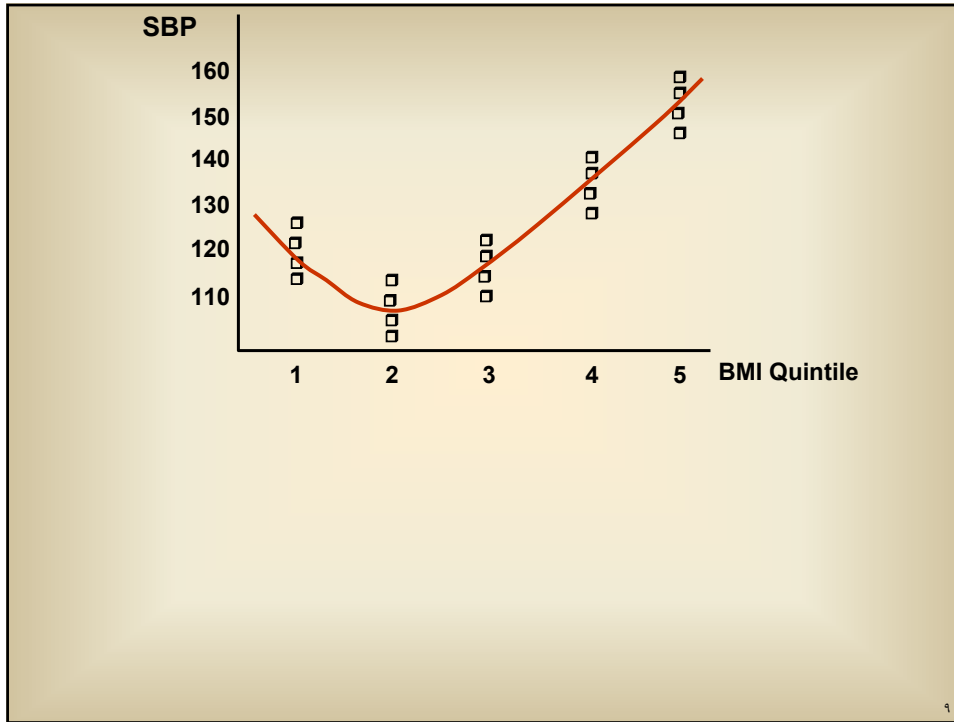


Scatter Plots

v



^



محاسبه ضریب همبستگی پیرسن

$$SS_x = \sum x^2 - n\bar{X}^2 = 32348 - 10(56.8)^2 = 85.6$$

$$SS_y = \sum y^2 - n\bar{Y}^2 = 139785 - 10(118.1)^2 = 308.9$$

$$SP_{xy} = \sum xy - n\bar{X}\bar{Y} = 67226 - 10(56.8)(118.1) = 145.2$$

$$r = \frac{SP_{xy}}{\sqrt{SS_x SS_y}} = \frac{145.2}{\sqrt{(85.6)(308.9)}} = 0.893$$

ضریب همبستگی
پیرسن

Misuses of the Correlation Coefficient

Strong correlation does not mean



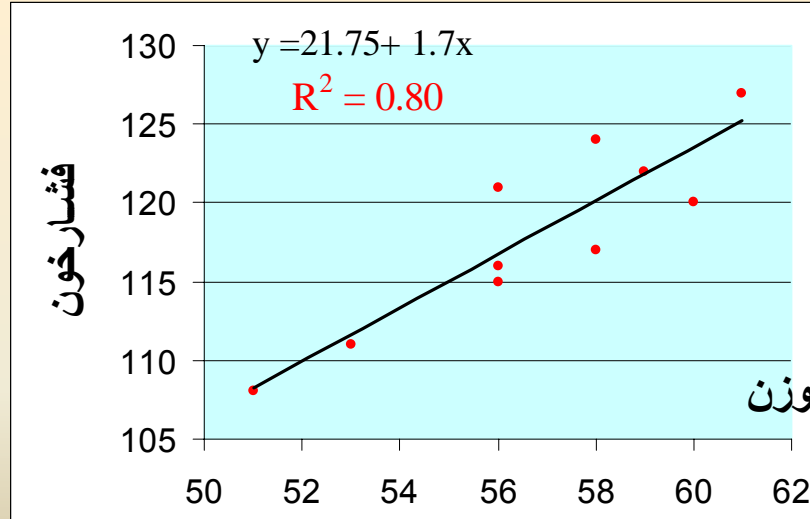
۱۳

رگرسیون خطی ساده

Simple Linear Regression

۱۴

خط رگرسیون ساده Simple Regression Line



۱۵

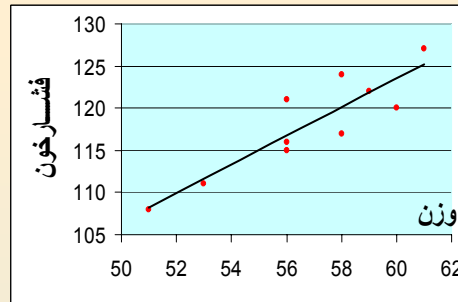
محاسبه خط رگرسیون

$$Y = a + bX$$

$$b = \frac{SP_{xy}}{SSx} = \frac{145.2}{85.6} = 1.7$$

$$a = \bar{Y} - b\bar{X} = 118.1 - (1.7)(56.8) = 21.75$$

$$Y = 21.75 + 1.7X$$



۱۶

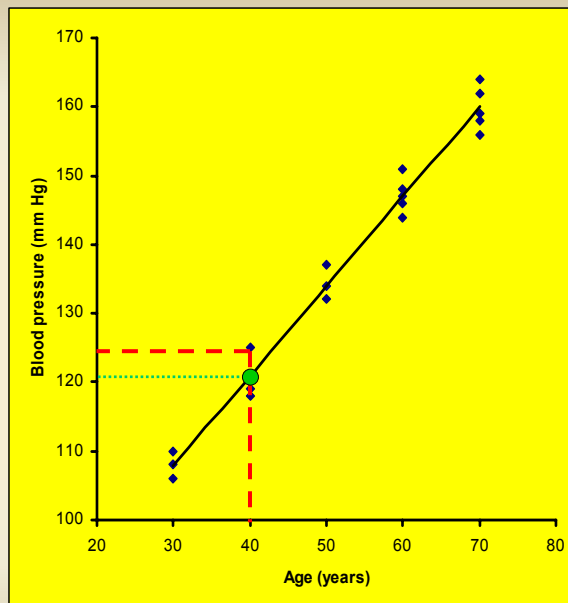
Marginal Change

- ❖ The amount of change in the **dependent** variable when the **independent** variable changes by exactly **one** unit:

$$BP = 21.75 + 1.7 \text{ Weight}$$

17

Age year	B.P. mm Hg
30	108
30	110
30	106
40	125
40	120
40	118
40	119
50	132
50	137
50	134
60	148
60	151
60	146
60	147
60	144
70	162
70	156
70	164
70	158
70	159



18