

SIMPLE LINEAR REGRESSION AND CORRELATION

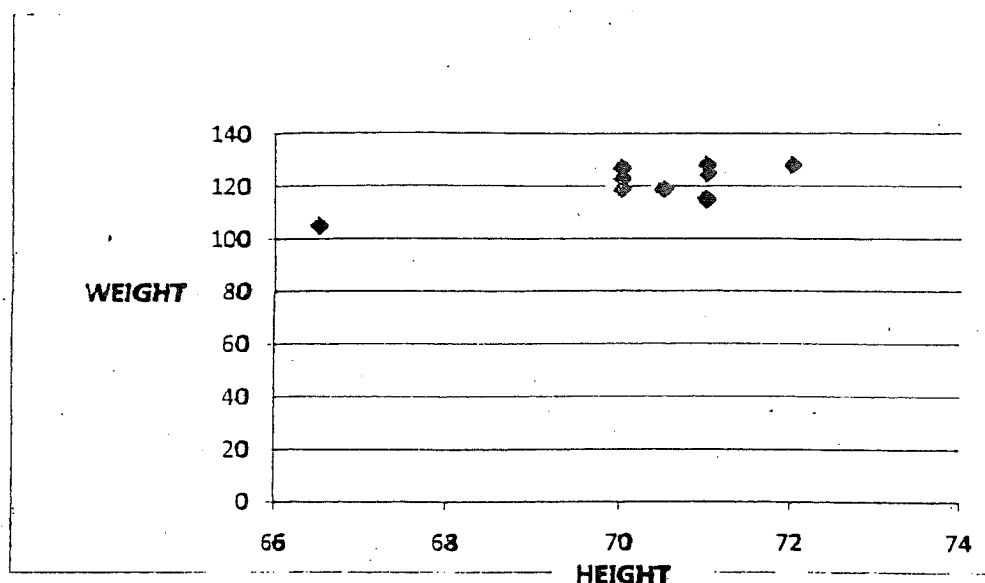
Listed below are heights (in inches) and weights (in pounds) for 9 supermodels.

If you are interested, they are Niki Taylor, Nadia Avermann, Claudia Schiffer, Elle MacPherson, Christy Turlington, Bridget Hall, Kate Moss, Valerie Mazza, and Kristy Hume.

Note: This is an old data set, so I can't promise that these weights are (or should be) the same

<u>height in inches (x)</u>	71	70.5	71	72	70	70	66.5	70	71
<u>weight in pounds (y)</u>	125	119	128	128	119	127	105	123	115

1) Display the data in a scatter plot and state the type of linear correlation (if any) that exists.



(positive correlation)

2) Calculate and interpret r (the coefficient of linear correlation).

$r = .796$ (strong positive linear correlation between height and weight)

3) Calculate and interpret r^2 (the coefficient of determination).

$r^2 = .633$ (63.3% of variation in the weight of a supermodel is explained by variation in height)

4) Find the equation of the least squares linear regression line.

$$\hat{y} = 3.8834x - 151.6997$$

5) Use your equation above to predict the weight of a supermodel who is 68 inches tall.

$$\hat{y} = 3.8834(68) - 151.6997 \approx 112.4 \quad (\text{approximately } 112.4 \text{ pounds})$$

x	y	STAT > CALC
L ₁	L ₂	LinReg (ax + b) L ₁ , L ₂
71	125	
70.5	119	ENTER
71	128	
72	128	LinReg
70	119	y = ax + b
70	127	a = 3.8834
66.5	105	b = -151.6997
70	123	r ² = .633
71	115	r = .796