Linear Regression Models

Data from the experiment: Effects of Cold water Temperature on Blood Pressure

Temp	Decrease in Pulse
68	2
65	5
70	1
62	10
60	9
55	13
58	10

The scatter plot shows a linear relationship between the temperature and the decrease in pulse. To find the equation of the line $y = mx + b$ that best fits the data from the experiment, use the formula below.

Least squares line:

$$m = \frac{N \cdot \sum xy - \sum x \cdot \sum y}{N \cdot \sum x^2 - \left(\sum x\right)^2} \qquad b = \frac{\sum y - m \cdot \sum x}{N}$$

	x	y	x^2	xy
	68	2	4624	136
	65	5	4225	325
	70	1	4900	70
	62	10	3844	620
	60	9	3600	540
	55	13	3025	715
	58	10	3364	580
SUM	**438**	**50**	**27582**	**2986**

$$m = \frac{7 \cdot 2986 - 438 \cdot 50}{7 \cdot 27582 - (438)^2}$$ Here use $N = 7$ for the number of data points

$$m = \frac{-998}{1230} = -0.81$$

$$b = \frac{50 - (-.81) \cdot 438}{7} = 57.83$$

The equation of the line that best fits the data is : $y = -0.81x + 57.83$