

The equation of the line best fit through the median

* The equation of the line of best fit, called the regression line, can be used to make predictions

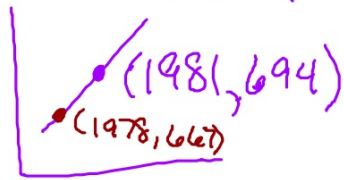
Ex) Back to PISA

a) Find the mean (of the x)

$$\overline{\text{YEAR}} = \frac{1975 + 1976 + \dots + 1987}{13} = 1981$$

b) Find the $\overline{\text{LEARN}} = 694$

mean point (1981, 694)

c)  choose another data point, preferably one on / close to line

d) Find the equation of regression line

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{694 - 667}{1981 - 1978} = 8.9$$

Option 1

Using $y = mx + b$ (final format) & finding b
mean pt (1981, 694); $m = 8.9$

$$694 = 8.9(1981) + b$$

$$694 = 17631 + b$$

$$-16937 = b$$

$$y = 8.9x - 16937$$

Option 2

Point-slope $y - y_1 = m(x - x_1)$

$$y - 694 = 8.9(x - 1981)$$

$$y - 694 = 8.9x - 17631$$

$$y = 8.9x - 16937$$

e) estimate the lean in 1990

$$y = 8.9(1990) - 16937$$

$$y \approx 774$$

HW p. 343 #1, 2

Understanding the Regression Line

Ex. A social science teacher has collected data on the number of days x per year a student plays sports and the number of hours y of homework that the same student does per week. She came up with the equation of the regression line $y = 40 - 0.3x$.

Interpret the y -intercept and slope.

y-intercept is 40:

The average student who plays no sports spends 40 hours a week on homework.

slope is -0.3:

As a student plays one more day of sports per year, they do $(0.3)(60)$ less minutes of homework per week.

Homework 10D P. 344, #2,4