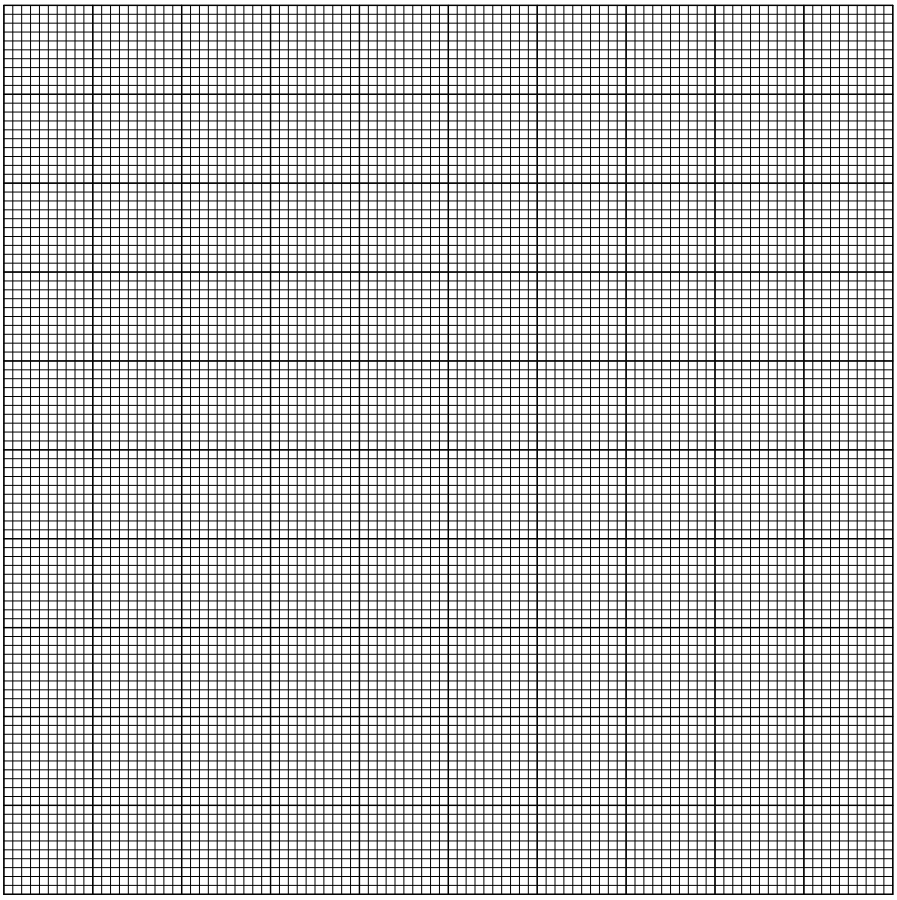
Question

You have collected the following data:

x	y
2.4	0.96
7	0.93
8.3	0.95
7	1
7.8	0.91

Please plot the data and a corresponding regression line.



Solution

Remember the formula for the correlation coefficient.

$$r = \frac{\sum x_i y_i - n\bar{x}\bar{y}}{(n-1)s_x s_y}$$

We calculate the necessary values.

x	y	xy
2.4	0.96	2.304
7	0.93	6.51
8.3	0.95	7.885
7	1	7
7.8	0.91	7.098
$\sum x = 32.5$	$\sum y = 4.75$	$\sum x_i y_i = 30.797$
$\bar{x} = 6.5$	$\bar{y} = 0.95$	
$s_x = 2.36$	$s_y = 0.0339$	

The regression line has the form

$$y = a + bx$$

So, a is the y-intercept and b is the slope. We have formulas to determine them:

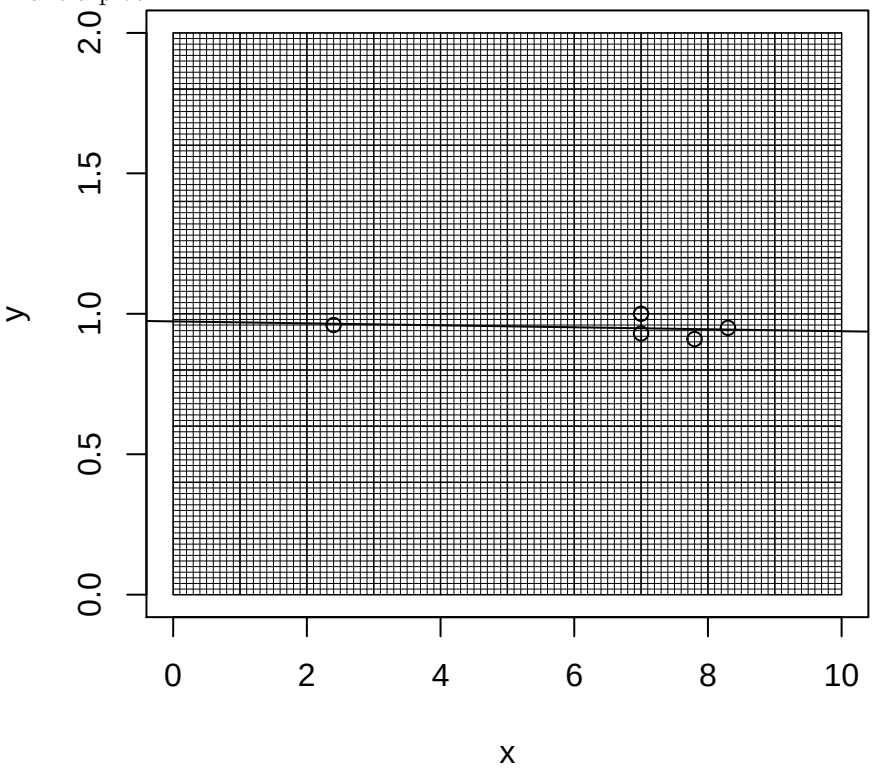
$$b = r\frac{s_y}{s_x} = -0.244 \cdot \frac{0.0339}{2.36} = -0.0035$$

$$a = \bar{y} - b\bar{x} = 0.95 - -0.0035 \cdot 6.5 = 0.973$$

Our regression line:

$$y = 0.973 + -0.0035x$$

Make a plot.



Meta-information

extype: num exsolution: 2.4, 7, 8.3, 7, 7.8 exname: binomial exact extol: 0.01