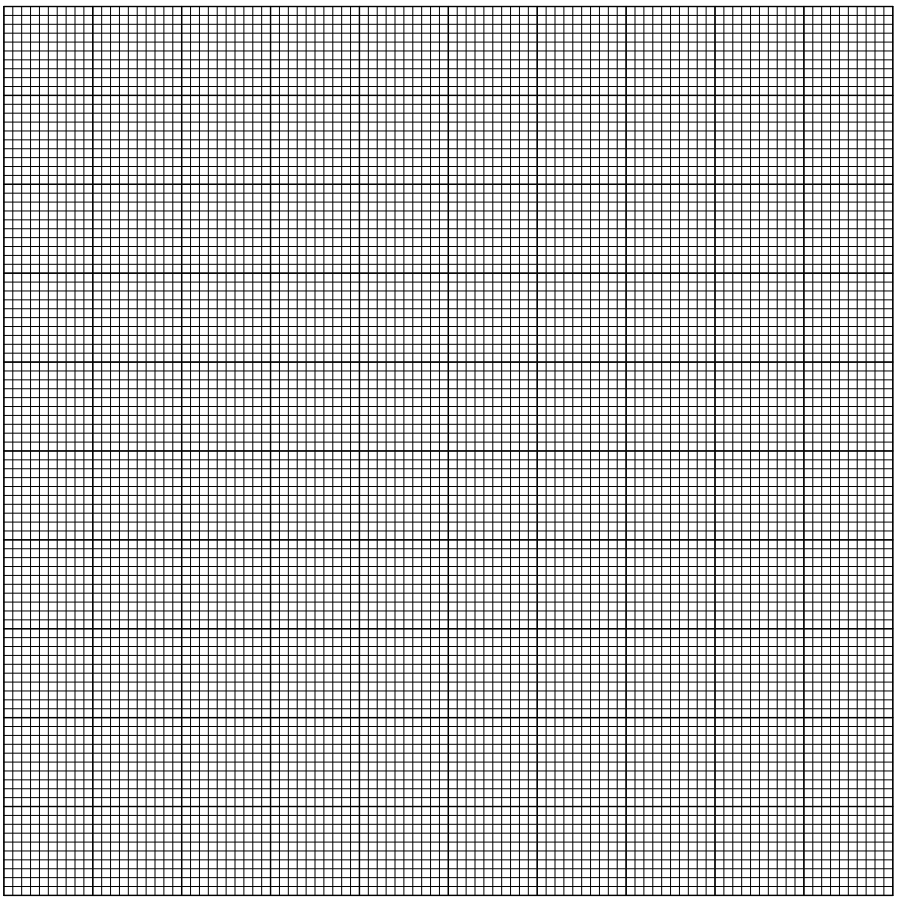
Question

You have collected the following data:

x	y
7.9	1.3
8.3	1.2
3	0.96
8.4	1.4
6.6	1.2
9.2	1.6
9.1	1.4
6.5	1.4
7.5	1.2
1.5	1

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
7.9	1.3	10.27
8.3	1.2	9.96
3	0.96	2.88
8.4	1.4	11.76
6.6	1.2	7.92
9.2	1.6	14.72
9.1	1.4	12.74
6.5	1.4	9.1
7.5	1.2	9
1.5	1	1.5
$\sum x = 68$	$\sum y = 12.66$	$\sum x_i y_i = 89.85$
$\bar{x} = 6.8$	$\bar{y} = 1.266$	
$s_x = 2.59$	$s_y = 0.196$	

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:

$$b = r\frac{s_y}{s_x} = 0.827 \cdot \frac{0.196}{2.59} = 0.0626$$

$$a = \bar{y} - b\bar{x} = 1.266 - 0.0626 \cdot 6.8 = 0.84$$

Our regression line:

$$y = 0.84 + 0.0626x$$

Make a plot.

Meta-information

extype: num exsolution: 7.9, 8.3, 3, 8.4, 6.6, 9.2, 9.1, 6.5, 7.5, 1.5 exname: binomial exact extol: 0.01