

Exercise 1:

Using the data below, calculate the correlation between IQ and exam scores and the associated coefficient of determination.

Student	IQ (X)	Exam Scores (Y)	x	y	xy
1	140	42	21.2	14.6	309.52
2	130	44	11.2	16.6	185.92
3	120	35	1.2	7.6	9.12
4	119	30	0.2	2.6	0.52
5	115	23	-3.8	-4.4	16.72
6	114	27	-4.8	-0.4	1.92
7	114	25	-4.8	-2.4	11.52
8	113	20	-5.8	-7.4	42.92
9	112	16	-6.8	-11.4	77.52
10	111	12	-7.8	-15.4	120.12
N=	$\sum X = 1188$	$\sum Y = 274$	$\sum xy = 775.8$		
	$\bar{X} = 118.8$	$\bar{Y} = 27.4$			
	$SD_x = 9.30$	$SD_y = 10.54$			

$$\text{Calculate } Cov_{xy} = \frac{\sum xy}{N-1} = \frac{775.8}{9} = 86.2$$

$$\text{Calculate } r_{xy} = \frac{Cov_{xy}}{SD_x SD_y} = \frac{86.2}{9.3 \times 10.54} = 0.88$$

Is the correlation a good one?

Yes.

Exercise 2:

A researcher is interested in determining the relationship between the popularity of 10 products as measured by a survey and their sales ranking. Using the rank data below, calculate the correlation between survey rank and sales rank and the associated coefficient of determination.

Student	Survey Rank (X)	Sales Rank (Y)	x	y	xy
1	1	8	-4.5	2.6	-11.7
2	2	4	-3.5	-1.4	4.9
3	3	6	-2.5	0.6	-1.5
4	4	10	-1.5	4.6	-6.9
5	5	7	-0.5	1.6	-0.8
6	6	2	+0.5	-3.4	-1.7
7	7	1	1.5	-4.4	-6.6
8	8	8	2.5	2.6	6.5
9	9	3	3.5	-2.4	~~11.6~~ -8.4
10	10	5	4.5	-0.4	-1.8
N=	$\sum X = 55$	$\sum Y = 54$	$\sum xy = -28$		
	$\bar{X} = 5.5$	$\bar{Y} = 5.4$			
	$SD_x = 3.03$	$SD_y = 2.91$			

$$\text{Calculate } Cov_{xy} = \frac{\sum xy}{N-1} = \frac{-28}{9} = -3.11$$

$$\text{Calculate } r_{xy} = \frac{Cov_{xy}}{SD_x SD_y} = \frac{-3.11}{3.03 \times 2.91} = -0.35$$

Is the correlation a good one?

No.