

Chapter 7 Problems

Subject	Code (X)	$X - \bar{X}$	$(X - \bar{X})^2$	Totals (Y)	$Y - \bar{Y}$	$(Y - \bar{Y})^2$	$(X - \bar{X})(Y - \bar{Y})$
1	1	1	1	30	-.67	.44	-.67
2	1	1	1	26	-4.67	21.78	-4.67
3	1	1	1	31	.33	.11	.33
4	1	1	1	30	-.67	.44	-.67
5	1	1	1	24	-6.67	44.44	-6.67
6	1	1	1	28	-2.67	7.11	-2.67
7	1	1	1	25	-5.67	32.11	-5.67
8	1	1	1	33	2.33	5.44	2.33
9	1	1	1	31	.33	.11	.33
10	-1	-1	1	36	5.33	28.44	-5.33
11	-1	-1	1	35	4.33	18.78	-4.33
12	-1	-1	1	27	-3.67	13.44	3.67
13	-1	-1	1	32	1.33	1.78	-1.33
14	-1	-1	1	29	-1.67	2.78	1.67
15	-1	-1	1	41	10.33	106.78	-10.33
16	-1	-1	1	36	5.33	28.44	-5.33
17	-1	-1	1	28	-2.67	7.11	2.67
18	-1	-1	1	30	-.67	.44	.67
SUM	0.00	0.00	18.00	552.00	0.00	320.00	-36.00
MEAN	0.00	0.00	1.00	30.67	0.00	17.78	-2.00

1. a. $r = \frac{\sum [(X - \bar{X})(Y - \bar{Y})]}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}} = \frac{-36}{\sqrt{18 \cdot 320}} = -.4743$

b. $b = \frac{\sum [(X - \bar{X})(Y - \bar{Y})]}{\sum (X - \bar{X})^2} = \frac{-36}{18} = -2.0$

$a = \bar{Y} - b\bar{X} = 30.67 - 2(0) = 30.67$

$Y' = 30.67 - 2.0X$

The negative regression coefficient tells us that the drug group (assigned the higher group code) took fewer trials learn the maze. We can also calculate that the mean of the drug group was $30.67 - 2(1) = 28.67$ trials, and the mean of the non drug group was $30.67 - 2(0) = 30.67$ trials to learn the maze.