

Statistics Assignment 4

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1. Compute the Pearson product-moment correlation coefficient by hand and show all your work

a. The value of R is: 0.5961.

| | Number Correct (out of a Possible 20) | Attitude (out of a possible 100) |
|----|------------------------------------------|-------------------------------------|
| N | (x) | (y) |
| 1 | 17 | 94 |
| 2 | 13 | 73 |
| 3 | 12 | 59 |
| 4 | 15 | 80 |
| 5 | 16 | 93 |
| 6 | 14 | 85 |
| 7 | 16 | 66 |
| 8 | 16 | 79 |
| 9 | 18 | 77 |
| 10 | 19 | 91 |
| | 156 | 797 |

X Values

$$\sum = 156$$

$$\text{Mean} = 15.6$$

$$\sum(X - M_x)^2 = SS_x = 42.4$$

Y Values

$$\sum = 797$$

$$\text{Mean} = 79.7$$

$$\sum(Y - M_y)^2 = SS_y = 1206.1$$

X and Y Combined

$$N = 10$$

$$\sum(X - M_x)(Y - M_y) = 134.8$$

R Calculation

$$r = \frac{\sum((X - M_x)(Y - M_y))}{\sqrt{((SS_x)(SS_y))}}$$

$$r = 134.8 / \sqrt{((42.4)(1206.1))} = 0.5961$$

r = 0.5961

X: X Values

Y: Y Values

M_x : Mean of X Values

M_y : Mean of Y Values

$X - M_x$ & $Y - M_y$: Deviation scores

$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared

$(X - M_x)(Y - M_y)$: Product of Deviation Scores

b. Construct a scatterplot for these 10 values by hand. Based on the scatterplot, would you predict the correlation to be direct or indirect? Why?

The data points are grouped from the lower left corner to the upper right corner in a positive slope. If the graph shows a direct relationship, then the line will go up. If it shows an inverse relationship, the line will go down.

