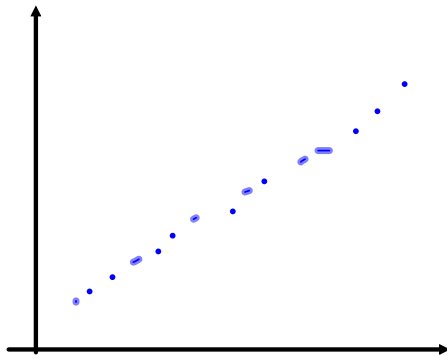


Correlation Coefficient

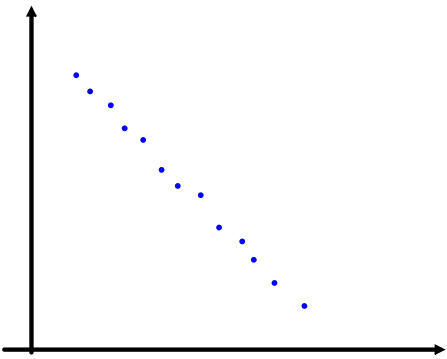
Goal:

- to approximate the correlation coefficient

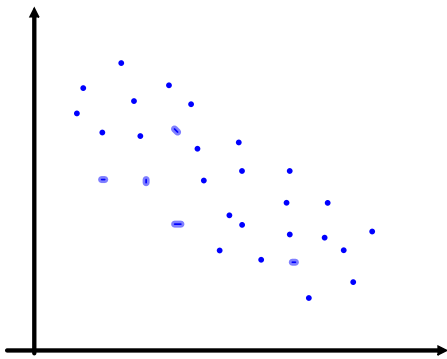
Describe the correlation of the following scatter plots.



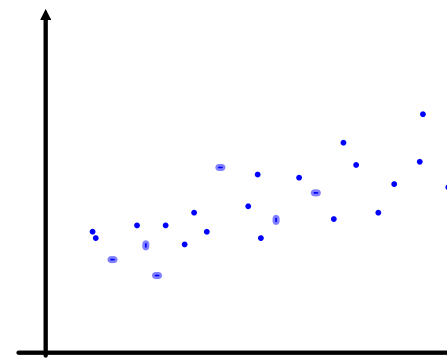
Very strong positive



Very strong negative

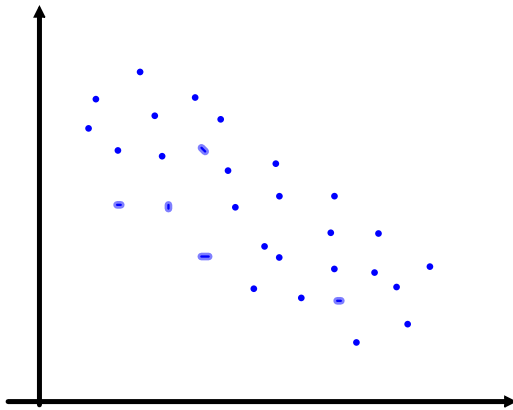


negative
weak? moderate?



positive
moderate? weak?

We can see that the weaker the correlation the harder it becomes to be specific about the strength of the correlation.



What characteristic about the points determines the correlation?

How close they come to making a straight line.

Statisticians have developed methods to quantify correlation. This number is called...

correlation coefficient

Correlation Coefficient	Description
0	Zero
$\begin{matrix} + \\ - \end{matrix}$ 0.5	Weak
$\begin{matrix} + \\ - \end{matrix}$ 0.75	Moderate
$\begin{matrix} + \\ - \end{matrix}$ 0.87	Strong
$\begin{matrix} + \\ - \end{matrix}$ 1	Perfect

To determine the correlation coefficient:



1. Draw line of best-fit
2. Draw the smallest possible rectangles that surrounds significant data points (sides of rectangle are parallel and perpendicular to line of best fit)

3. Measure dimensions of rectangle

4. Use formula:

Correlation coefficient = r

$$r \approx \pm \left(1 - \frac{\text{width}}{\text{length}} \right)$$

you choose

Ex:

$$r \approx - \left(1 - \frac{3.1}{8} \right)$$

$$r \approx - 0.6125$$

negative weak/moderate correlation

Homework:

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