- Let X, Y be random variables. If X, Y are independent, then

$$\mathbb{E}[XY] = \mathbb{E}[X]\mathbb{E}[Y].$$

- So let us define the **covariance** of X, Y:

$$\text{cov}(X, Y) = \mathbb{E}[XY] - \mathbb{E}[X]\mathbb{E}[Y].$$

Meaning

When $\text{cov}(X, Y) > 0$, this means X, Y are "more likely to agree"...