New Formula
\[ r = \frac{\sum x \cdot y}{n-1} \]

Positive Correlation
\[ x = \frac{\sum x}{n}, \quad y = \frac{\sum y}{n} \]
Most points are in upper right or lower left where \( z_x \cdot z_y > 0 \).
Thus,
\[ r = \frac{\sum z_x \cdot z_y > 0}{n-1} \]

Negative Correlation
Most points are in upper left or lower right where \( z_x \cdot z_y < 0 \).
Thus
\[ r = \frac{\sum z_x \cdot z_y < 0}{n-1} \]

No Correlation
We tend to have as many pts where \( z_x \cdot z_y > 0 \) & \( z_x \cdot z_y < 0 \)
so \( r \approx 0 \).