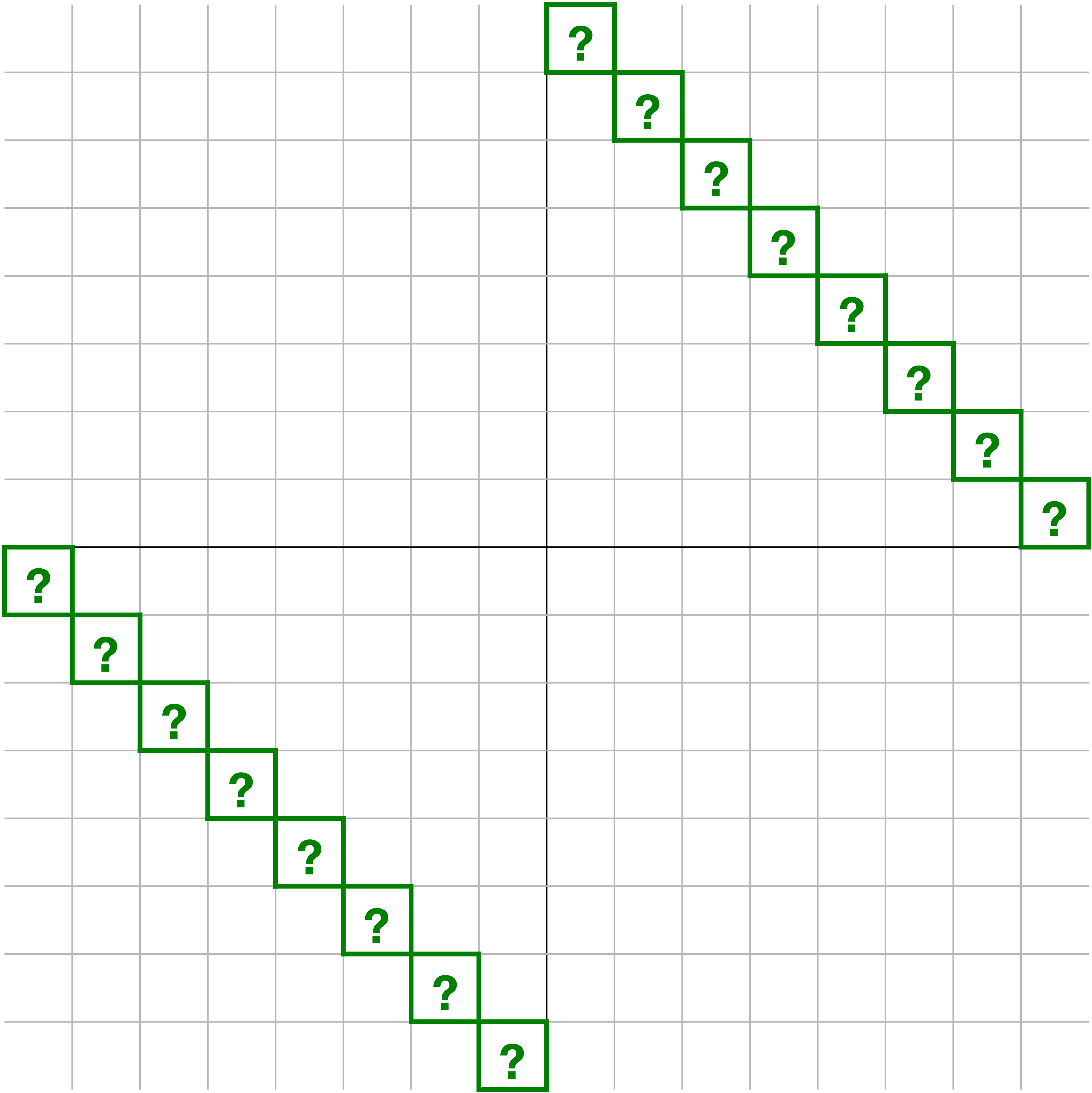
# Mean absolute correlation (MAC)



$$\mathbf{corr}(X, \tilde{X}) =$$

$$\textbf{corr}(X_i, \tilde{X}_j) = \textbf{corr}(X_i, X_j) \textbf{ if } i \neq j$$

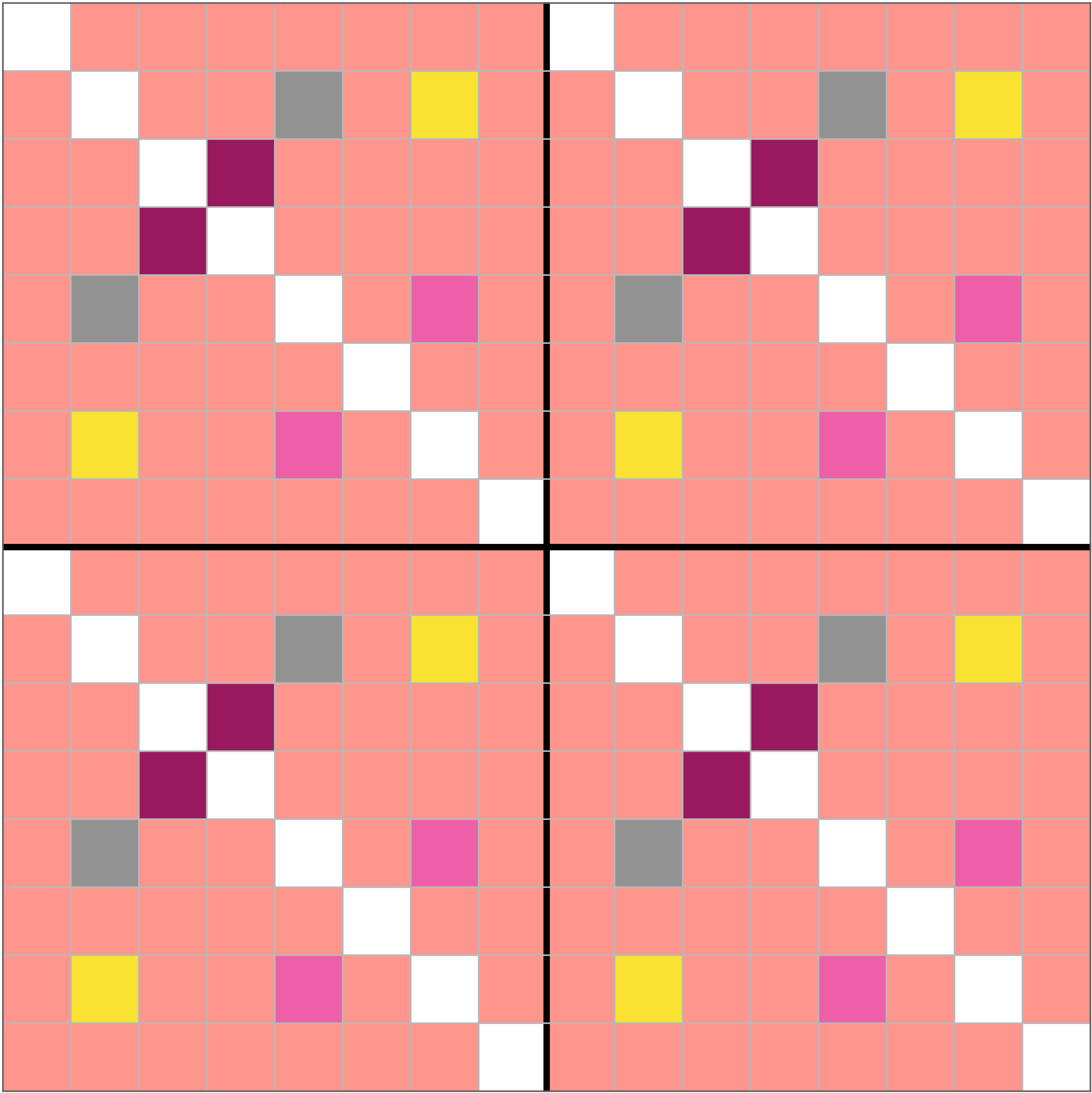
$$\mathbf{corr}(\tilde{X}_i, \tilde{X}_j) = \mathbf{corr}(X_i, X_j)$$

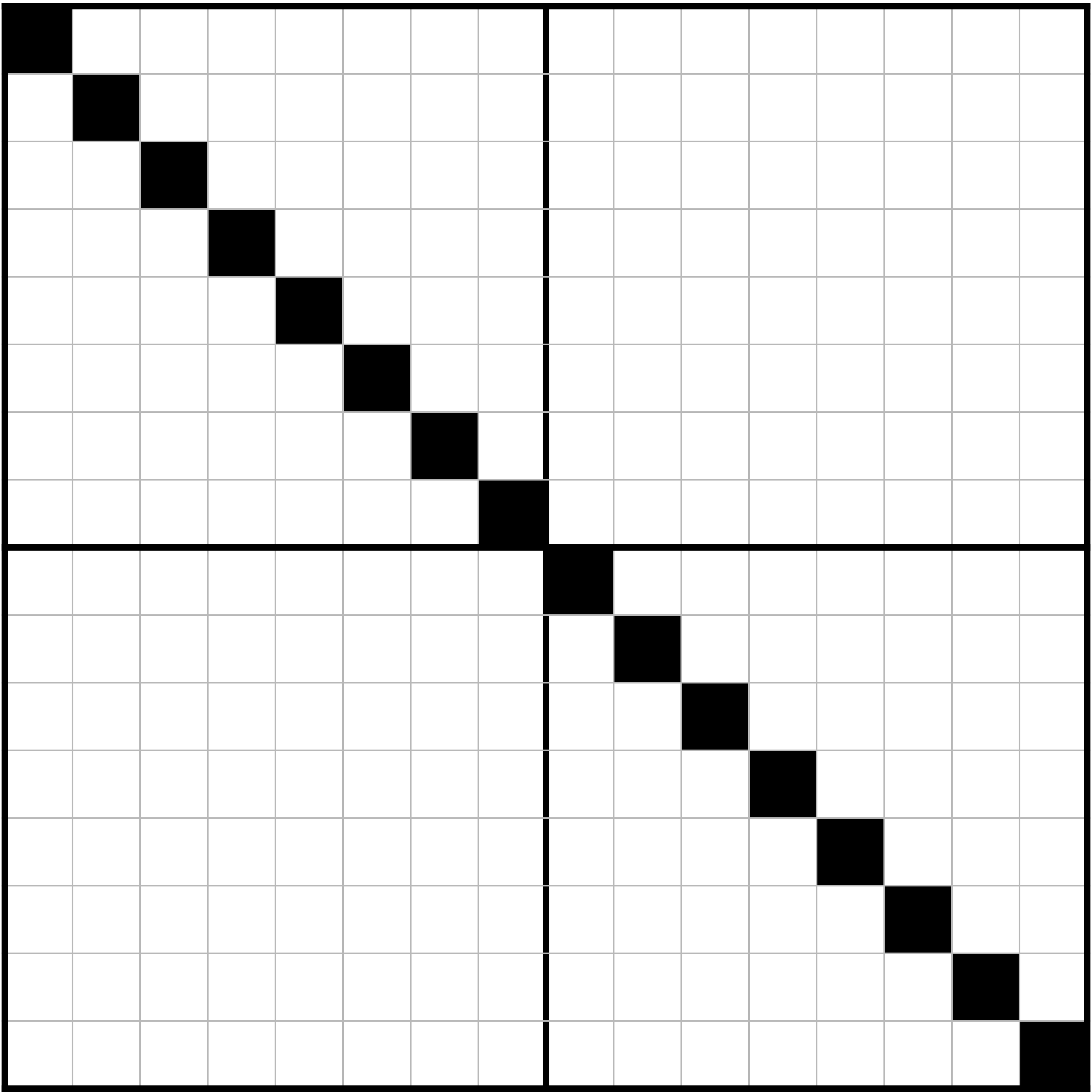
$$\mathbf{MAC} = \frac{1}{p} \sum_{j=1}^{p} |\, \mathbf{corr}(X_j, \tilde{X}_j) \,| = \frac{1}{p} \sum_{j=1}^{p} | \quad |$$

has a non-negative lower bound because correlation matrix is positive definite

For **any** valid knockoff distribution

lower bound is computable but not necessarily achievable





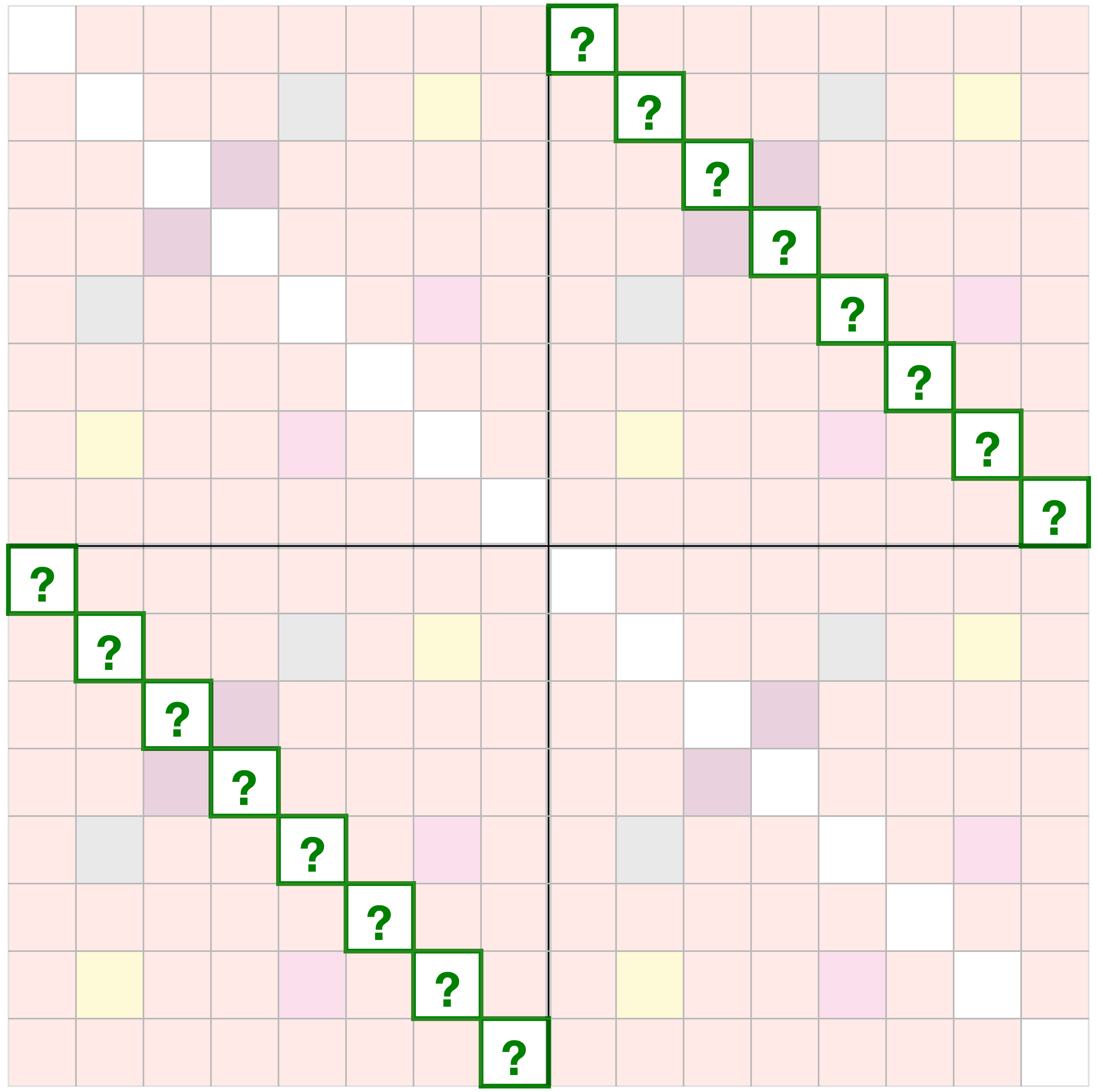
# Mean absolute correlation (MAC)

For **any** valid knockoff distribution

**corr**$(X_i, \tilde{X}_j) =$ **corr**$(X_i, X_j)$ **if** $i \neq j$

**corr**$(\tilde{X}_i, \tilde{X}_j) =$ **corr**$(X_i, X_j)$

**corr**$(X, \tilde{X}) =$



**MAC** $= \dfrac{1}{p} \displaystyle\sum_{j=1}^{p} |\,\textbf{corr}(X_j, \tilde{X}_j)\,| = \dfrac{1}{p} \sum_{j=1}^{p} |\,\textbf{?}\,|$

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# Power and MAC

Across different knockoff sampling methods, MAC translates well to FDR and power