$$Z_{ik} = XY = \sum_k X_{ij} Y_{jk}$$
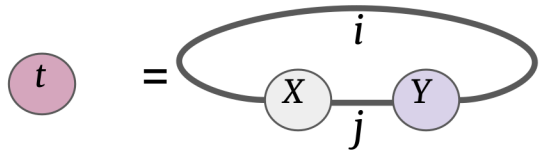
$$t = \text{Tr}[XY] = \sum_j \sum_i X_{ij} Y_{ji}$$