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Exercise 1

Problem 1.1 (Kronecker vector product)**.** Let A and B denote two $n \times n$ matrices and let x be a vector of length n^2. Now, consider the matrix-vector product

$$y = (A \otimes B)x$$

in which the matrix consists of the Kronecker product of A and B.
What is the number of operations needed to evaluate this matrix-vector product? Compare this "straightforward" approach with an alternative approach that is based on the reformulation in the form of a matrix-matrix-matrix product introduced in the lecture.