

Exercises

1. Suppose A is an arbitrary $n \times n$ matrix and v is a given n -vector. Show how to replace the diagonal entries of A with the entries of v .
2. (a) Let W be a 60×60 matrix of zeros and ones, uniformly randomly distributed.
(b) Find the column sums and row sums of W .
(c) Rescale the columns of W so that the column sums of the result are all equal to one. This should be done without any loops.
3. Say you have a deck of 52 cards and perform a perfect shuffle, as follows. Divide the cards into two equal stacks. Release them so that they fall alternately one at a time, beginning with the card that was *not* on the bottom of the deck before.

This operation produces a permutation of the deck that can be described by a permutation matrix P applied on the left to a vector of the original ordering. Write code to construct the matrix P *using as few characters as possible*. You do not have to count spaces or new lines as characters.