

COMPUTER SCIENCE I

Exercise 9

1. Read a one dimensional array w from a file. The file should look in a following way:

```
n
w1
w2
w3
...
wn
```

2. Create a matrix B defined by the formula: $B = I - 2ww^T$, or: $B_{ij} = \begin{cases} 1 - 2w_i w_j & i = j \\ - 2w_i w_j & i \neq j \end{cases}$.

The matrix should be static. Check the size of the matrix (it should be less or equal the n). Write a function which will print the matrix to the file "mac.txt".

3. Write two functions:

- first one should calculate multiplication of two matrices A and B:

$$C = A * B, \text{ in other way } C_{ij} = \sum_{k=1}^n A_{ik} B_{kj};$$

- second one should calculate a transpose to the given matrix.

4. Use both functions from point 3 and calculate:

$$C = BB^T$$