

### Practical assignment 1

- 1) Define two integer random matrices 5x5: matrix A with random entries [0;10] and matrix B with random entries [-5;5]. Compute
  1. Matrix product
  2. Pointwise matrix product
  3. Square of A
  4. Pointwise square of A
  5. Determinant of B
  6. Transpose of B
  7. Inverse of B
  8. Trace of A
  9. Column sum of A
  10. Row sum of B
  11. Average value of all elements of A
  12. Diagonal sum of B
  13. Set last entry of B to the value 7.
  14. Delete last row of A.
  15. Delete first column of B
  16. Sort entries of B in each row.
  17. Flip A left right
  18. Rotate B to 90 degrees.
  
- 2) Plot a graph of a function  $\sin(x)$  where  $x$  is from  $[-\pi;\pi]$  with step 0.3.
  
- 3) Write a function MaxDiag (in m-file) which computes maximum among all diagonal entries of a given matrix.
  
- 4) Define a random sparse matrix of size 1000 with density 0.1. Plot a pattern of sparse matrix. Convert to the dense form. Estimate time for solving the system  $Ax=b$  when A is sparse and when A is dense.