Lab. 1 Introduction to MATLAB / Octave

Do the exercises below should be done in the Octave IDE. You should only use assignments operations with arithmetic expressions including pre-defined MATLAB functions. Also use scripts to avoid "too much typing".

1. **Solve a 1st degree equation**
   Type in two numbers a_0 and a_1 solve equation $a_1x + a_0 = 0$.

2. **Solve a 2nd degree equation**
   Type in three numbers a_0, a_1 and a_2, solve equation $a_2x + a_1x + a_0 = 0$.
   Note: Try cases with complex solutions.

3. **Maximum of n numbers**
   Type in **n** numbers x_1, x_1, … , x_n and obtain the maximum of them.
   Note: Use a vector and the adequate predefined function.

4. **System of Linear Equations of n numbers**
   Type in numbers $a_{i,j}$ and b_i (where **i** in **1..m**, **j** in **1..n**, and **m, n > 1**) and solve the corresponding system of linear equations.
   Note: Use predefined matrix operations.

5. **Length of a vector**
   Type in numbers a_i (where **i** in **1..m**, and **m > 1**) and find the length of the n-dimensional vector a_ix_i.
   Note: Use predefined vector operations.

6. **Angle between 2 vectors**
   Type in numbers a_i and b_i (where **i** in **1..m**, and **m > 1**) and find the angle between the n-dimensional vectors a_ix_i and b_ix_i.
   Note: Use predefined vector operations.

7. **Angle between 2 planes**
   Type in numbers a_i and b_i (where i in 0..3) and find the angle between the planes A and B (defined by $\sum a_ix_i = a_0$.

8. **Power of a Matrix**
   Type in numbers $a_{i,j}$ (where **i** in **1..m**, **j** in **1..n**, and **m, n > 1**) defining matrix A and obtain the matrix B whose members are the power k of the corresponding members of B.

9. **Filter and Count Elements**
   Type in non-negative integers numbers a_i (where **i** in **1..m**, and **m > 1**) and find how many of these are in the interval **p..q** (where **p** and **q** are also integers)