LAB ASSIGNMENT 1 – Instruction

1. Start the Matlab session and create new m-file
2. Assume a symmetric matrix **T** of size 2x2
3. Plot T(**n**) for a number of various unit vectors **n**
    - start the *for* loop - dividing the full angle (0, 2*pi) into the sequence of angles with the prescribed increment (e.g.: 0.5, 0.1, …)
    - calculate coordinates of the unit vectors, namely the *cos* and *sin* of the current angle
    - plot the input and output vectors using the *quiver* Matlab function
    - end the *for* loop
    - run the code and observe for which angle the input and output vectors are parallel (approximately)
4. Find more precisely an input vector **n0** such that the corresponding output vector T(**n0**) is parallel to **n0**
    - solve the eigen problem of the matrix **T**; copy the elements of one of the two eigen vectors to **n0**
    - find the output vector **T***n0**; check if those two vectors (**n0**, **T***n0**) are parallel
5. Transform matrix **T** to the coordinate system with one of the axes parallel to **n0.** The final **T0** matrix should have the diagonal form
6. Use the elimination method to evaluate determinants of both assumed and transformed matrices
    - transform matrix **T** to the upper triangular form
    - calculate the determinants of the matrices **T** and **T0** as the products of their main diagonal elements
    - examine the correctness of the results by means of the Matlab function *det*