CS1112 Lab Exercise 8

1 Subarrays

Type the following expressions in the MATLAB *Command Window*. Write the resulting array or answer the question on the blank.

```
A= [9 8 7 2 0]

b= A(3)

C= A(3:5)           % _____________________________

D= [A; ...
    ones(1,5); ...
    4*ones(1,5)]    % _____________________________

E= D(1:3,2:4)       % _____________________________

F= D(:,2)           % _____________________________
% What does the colon mean when it is used where indices are expected?

% Ask for help now if you are unsure how to access a subarray
```

2 Determinant of a 3×3 matrix

Write a function `myDeterminant(x)`, where `x` is a 3×3 matrix. Use the following formula:

$$\det\left(\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}\right) = a\det\left(\begin{pmatrix} e & f \\ h & i \end{pmatrix}\right) - b\det\left(\begin{pmatrix} d & f \\ g & i \end{pmatrix}\right) + c\det\left(\begin{pmatrix} d & e \\ g & h \end{pmatrix}\right)$$

Use the built-in function `det` to find the determinants of 2×2 matrices. For example, `det(m)` returns the determinant of 2×2 matrix `m`. This question is all about accessing individual components or submatrices in a matrix. Recall that you can construct a matrix by putting two row vectors one below the other or two column vectors side by side.

3 Random walk

A random walk that starts from the center of a 21×21 grid ends when a boundary is reached. On average which "square" or grid point is visited most often? Function `RandomWalk2D` can be found on the *Lecture Materials* page of the course website (lecture 11).

4 Bounded random walk

In a bounded random walk, a set number of steps are taken within a bounded area. For example, when the right boundary (excluding the corners) is reached, the next step can go left, up, or down only. Similarly, when a corner is reached, the next steps can be in two directions only. For a 100-step bounded random walk in a 21×21 grid, which "square" is visited most often?

Please delete your files from the computer before leaving the lab.