1 Subarray

Type each of the following expressions in the MATLAB Command Window (and press Enter) to see what it does. Write the screen output on each blank.

\[
A= \begin{bmatrix} 9 & 8 & 7 & 2 & 0 \end{bmatrix}
\]

\[b= A(3)\]

\[C= A(3:5)\] % _________________________________

\[D= [A; ...\]
\[\quad \text{ones}(1,5); ...\]
\[\quad 4*\text{ones}(1,5)]\] % _________________________________

\[E= D(1:3,2:4)\] % _________________________________

\[F= D(:,2)\] % _________________________________

% 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 Find a value in a matrix

Write the following function:

\[
\text{function } [r, c] = \text{findInMatrix}(n,M) \\
\% Find all occurrences of the number } n \text{ in matrix } M. \\
\% r \text{ and } c \text{ are column vectors of row and column numbers such that } \\
\% M(r(k),c(k)) \text{ is equal to } n. \\
\% If } n \text{ is not found in } M, r \text{ and } c \text{ are empty vectors.}
\]

Example: Given matrix \(D\) from Question 1 above, the function call \([rs, cs]= \text{findInMatrix}(4,D)\) should return in \(rs\) the vector \([3; 3; 3; 3; 3]\) and in \(cs\) the vector \([1; 2; 3; 4; 5]\).

Use loop(s). Do not use any built-in functions other than size. For extra practice, first hand-write the solution without using the computer. Then type up your function in MATLAB for testing.

3 Cumulative sums

Write the following function:

\[
\text{function } A = \text{matrixCSums}(M) \\
\% M \text{ is a numeric matrix and } A \text{ has the same size as } M. \\
\% Each element in } A \text{ is the sum of the corresponding element in } M \text{ and all} \\
\% the elements above it. Example:} \\
\% \quad M = \begin{bmatrix} 1 & 3; \ldots \end{bmatrix} \quad A = \begin{bmatrix} 1 & 3; \ldots \end{bmatrix} \\
\% \quad 4 & 5; \ldots \quad \text{then} \quad 5 & 8; \ldots \\
\% \quad -7 & 2] \quad -2 10] \quad \% \text{Do NOT use any built-in functions other than size}
\]

Use any remaining time to ask questions or work on Assignment A1b!

In the computer lab, please delete your files from the computer before you leave.