CS 1112 Exercise 8 Name: ______________________________ NetID: ______

You have until *Sunday, March 15, at 9:00 PM* to complete and submit Problems 2 and 3 of this exercise using *Matlab Grader*. Problem 1 does not require check-off, but be sure to do it to learn syntax for accessing *subarrays* (*vectorized code*) and 3-d array.

1 Subarrays

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

```
m= rand(6,5)

a= m(:,2)      % What does the colon specify when used in place of an index? _____________


b= m(2:3,:)    % __________________________________________________________________________

p= rand(6,5,3) % This is a 3-dimensional array

[nr, nc, np]= size(p)  % _____________________________________________________________

c= p(:,:,2)    % Is this a matrix (2-d) or a 3-d array? ___________________________________

d= p(4,:,2)    % Is this a vector, matrix, or 3-d array? __________________________________
```

2 Find a value in a matrix

Implement the following function as specified. Use loops in this problem; *do not* use any built-in functions other than size.

```
function [rvec, cvec] = findInMatrix(n,M)
% Find all occurrences of the number `n` in matrix `M`.
% `rvec` and `cvec` are column vectors of row and column numbers such that
%   `M(rvec(k),cvec(k))` is equal to `n`.
% The length of `rvec` and `cvec` is the number of times `n` appears in `M`.
% If `n` is not found in `M`, `rvec` and `cvec` are empty vectors.
% Do not use any built-in functions other than `size()`.
```

3 Cumulative sums

Implement the following function as specified. Do *not* use any built-in functions other than size.

```
function A = matrixCSums(M)
% `M` is a numeric matrix and `A` has the same size as `M`.  Assume `M`
% is not empty.  Each element in `A` is the sum of the corresponding
% element in `M` and all the elements above it.  Example:
%   M = [ 1 3; ...             A = [ 1  3; ...
%         4 5; ...     then          5  8; ...
%        -7 2]                      -2 10]
% Do not use any built-in functions other than `size()`.
```

Please delete your files from the lab computer before you leave the lab.