General Computer Science for Engineers CISC 106 Lecture 25

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Lecture Overview

- Midterm Review

Looping through a 2d array

- x = [1 2 3; 4 5 6];

```
for k = 1:3
    for n = 1:2
        x(n, k);
    end
end
```

What will this print?

Looping through a 2d array

- x = [1 2 3; 4 5 6; 7 8 9];

Print only 2nd column (do not use the colon operator)

Printing a sub-array

>> m = [1 2 3 4 5 6 7 8];

- How do you extract [6 7 8] from the matrix m shown?

- How do you extract [2 3 4] from the matrix m shown?

Practice Problems

- Practice problems were uploaded (3 weeks ago). You should know how to do them as we will base some of the midterm on those!

Pop Quiz

- Get a sheet of paper and do the following problem
- Will serve as proof of attendance
- Write a function called **sameAsAbove**

Pop Quiz (func: sameAsAbove)

- Pass as input a 2d array (a matrix). Loop through it and print the position and value of every position where the position directly above it has the same value. e.g.

 [1 2 3; 2 2 3; 4 5 3] would print out EXACTLY:

2,2 and 1,2 = 2

2,3 and 1,3 = 3

3,3 and 2,3 = 3

Loops

- How do you loop only odd elements in an array?

- How do you loop through every element that is a multiple of 5 (starting at 5)?

Conditional expressions

- How to test whether variable x is between the values 0 and 5?

- How do you test whether x is between 5 and 15 or between 30 and 55?

Script versus Functions

- Can a script take in a parameter?
- Can a function change a variable in your current environment?
- Can a script return an output?
- Can you call a script by name?

Recursive Functions

- Study this!
- Be able to code a recursive function from a recursive definition
- Review (at least) the following:
  - Lecture 9
  - Lab 4 and Lab 6

Recursive Functions

expt(base,exponent) = base, if exponent is one

base * expt(base,exponent-1) otherwise

Write the code that implements the "expt" function.

Recursive Functions

```
function num = expt(base,exponent)
    if (exponent == 1)
        num = base;
    else
        exponent = exponent - 1;
        num = base * expt(base,exponent);
    end
end
```