



General Computer Science for Engineers CISC 106 Midterm 2 Review

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Lecture Overview

- Looping
- Scripts vs functions
- Recursive functions
- Selection sort

Print rows

- ```
x = [1 2 3; 4 5 6; 7 8 9];
 for k = 1:3
 for n = 1:3
 x(k, n)
 end
 end
end
```

## Print columns

- ```
x = [1 2 3; 4 5 6; 7 8 9];  
  for k = 1:3  
    for n = 1:3  
      x(n, k)  
    end  
  end
```

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 and 10
 - 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
```


Selection Sort (English)

while not at end of array

find the minimum value from the current location (loc) to the end of the array

swap the current loc with the min's loc

End while

Selection Sort (pseudo code)

Loop through from $i = 0$ to $n-1$

$\text{minLoc} = i$

$\text{min} = \text{array}[i]$

 Loop through from $j = i+1$ to n

 if $\text{min} > \text{array}[j]$ then

$\text{minLoc} = j$

 end inner loop

$\text{tmp} = \text{array}[i]$

$\text{array}[i] = \text{array}[\text{minLoc}]$

$\text{array}[\text{minLoc}] = \text{tmp}$

end outer loop