General Computer Science for Engineers CISC 106 Lecture 23

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Lecture Overview

- The : operator (pgs. 35-37)
- Struct arrays (pgs. 340-350)

How to use the : operator

A(:,j) returns the jth column of A

For example A(:,2)

A =

1	2	3
4	5	6
7	8	9

How to use the : operator

A(i,:) returns the ith row of A

For example: A(3,:)

A =

1	2	3
4	5	6
7	8	9

How to use the : operator

A(a:b) gives the a^{th} - b^{th} elements of A

```
>> A = [1 2 3; 4 5 6; 7 8 9]
A =
     1     2     3
     4     5     6
     7     8     9
```

A(3:6) → 7 2 5 8

How to use the : operator

A(c:end)

gives all of the elements of A from the c^{th} element to the end

```
>> A = [1 2 3; 4 5 6; 7 8 9]
A =
     1     2     3
     4     5     6
     7     8     9
```

A(5:end) → 5 8 3 6 9

What is a Struct Array?

- A struct array is a way to store one or more structs of related information
- An array of structs can be thought of as a database

Struct Array Syntax

There are multiple ways to create a struct array:

s = struct('field1', {}, 'field2', {}, ...) creates an empty structure with fields field1, field2, ...

s = struct creates a structure with no fields.

s = struct([]) creates an empty structure with no fields.

Struct Array Example

```
s = struct('fish',{{'flipper','swimmie'}},'age',{[4], [7]})
s =
   fish: {'flipper'  'swimmie'}
   age: [4 7]

s(1)
ans=
      fish: 'flipper'
      age: 4
```

Problem Solving Steps (Part I)

- On a piece of paper:
- Write the problem, in your own words, in English.
- Write a solution for the problem in English in your own words
- Write pseudocode or a flowchart of your solution

Problem Solving Steps (Part II)

- Write test values and a test script for your function
- Write the first draft of your function
- Now, in Matlab, type in your test script and function
- Test your function and debug

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