Computer Programming 143 – Lecture 17
Arrays IV

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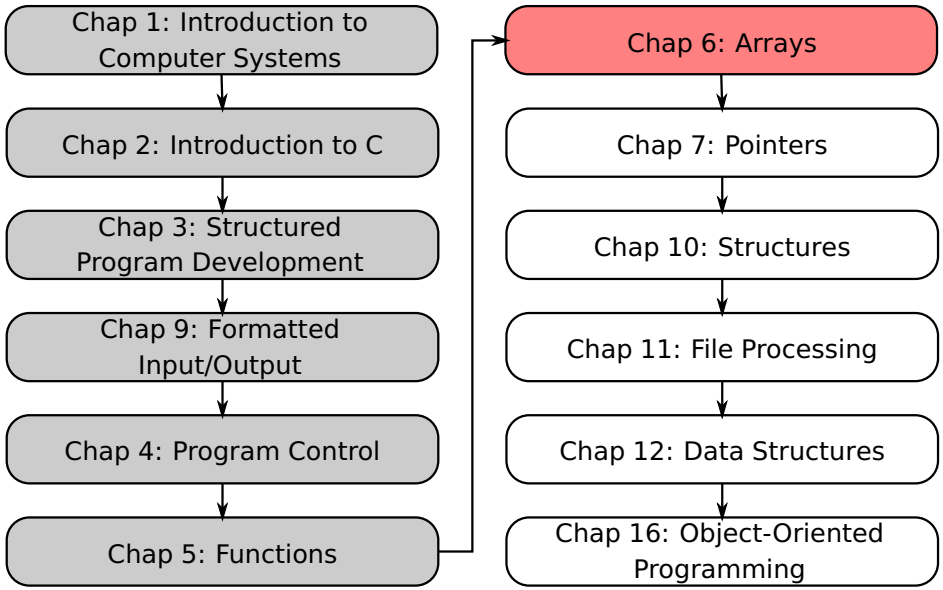
Module Overview

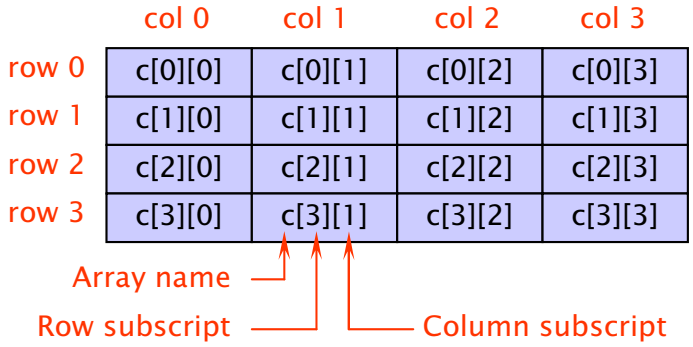


Lecture Overview

6.11 Multiple-Subscripted Arrays I

Multiple-Subscripted Arrays

- Tables with rows and columns (**m** by **n** array)
- Like matrices: specify row, then column



6.11 Multiple-Subscripted Arrays II

Initialisation

```
int b[ 2 ][ 2 ] = { { 1, 2 }, { 3, 4 } };
```

- Initialisers grouped by row in braces
- If not enough, unspecified elements set to zero

```
int b[ 2 ][ 2 ] = { { 1 }, { 3, 4 } };
```

1	2
3	4

1	0
3	4

Referencing elements

- Specify row, then column

```
printf( "%d", b[ 0 ][ 1 ] );
```

Refer to Fig. 6.21 and 6.22 in Deitel & Deitel for examples

Debugging

What is debuging?

- It is a systematic process of identifying and fixing errors (bugs) in a computer program
  - Errors may lead to wrong results or code that does not compile

Debugging methods

Using printf () statements

- print out the data in a particular variable to see if it is as expected
- print out a statement just to be certain that statements dependent on a condition are executed

Use *.....*\ comment blocks

- block out large sections that may be leading to an error
- continuously unblock single statements / small sections until the error occurs

Test Information I

Format of test

- 2 hours, approximately 60 marks
- Written

Test Information II

Example question formats

Similar to that asked in practical tests

- Write C code that would give the following output...
- What would the following program display on the screen?...
- Complete the C code...
- Write C code that would solve the following problem...
- Use the ... selection/repetition structure to do...
- Write C code that would implement the following flow diagram/pseudocode...
- Identify the errors in following code...
- Name three of the six phases a C program typically goes through to be executed.

Test Information III

Resources

- Textbook
- Class notes and example programs (SUNLearn)
- Homework problems (class notes)
- List of programming exercises (SUNLearn)

Test Information IV

List of topic covered

Refer to the class notes for a complete list

- Chapter 1: Introduction to computers - *hardware, software, computer organisation, computer languages, C standard library, structured programming, object technology, C development environment*
- Chapter 2: Introduction to C programming - *program structure, input ('scanf') and output ('printf'), variables, arithmetic, relational operators*
- Chapter 3: Structured programming development - *algorithms, pseudocode, flow diagrams, control structures, 'if', 'if...else' and 'while' statements, algorithm design using top-down, step-wise refinement, assignment, increment and decrement operators*
- Chapter 9: Formatted input/output - *'printf', 'scanf', precision, field width*

Test Information V

List of topic covered (cont...)

Refer to the class notes for a complete list

- Chapter 4: Program control - *counter- and sentinel-controlled repetition, 'for', 'do...while' and 'switch' statements, logical operators, 'break'*
- Chapter 5: Functions - *components of a function, function calls, math library functions, function definitions and prototypes, casting, header files, passing arguments by value and by reference, random number generation, storage classes, scope rules, recursive functions*
- Chapter 6: Arrays - *declaration, initialisation and use of arrays, strings, symbolic constants, passing arrays to functions, linear and binary search of arrays, sorting arrays (bubble sort), multiple-subscripted arrays*

Perspective

Today

Arrays IV

- Multiple-subscripted arrays

Debugging

Test Information

Homework

Homework

- Prepare for test.