Last Class

CSC 1051 – Data Structures and Algorithms I

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Course website:
www.csc.villanova.edu/~map/1051/

Some slides in this presentation are adapted from the slides accompanying Java Software Solutions by Lewis & Loftus
We learned

- Fundamental algorithms
  - finding max/min, average
  - repeated interactive input
  - processing lists
  - processing 2D tables of data
  - file management

- Fundamental data structures
  - Classes that aggregate information (e.g., Account, Shoe, Person, PassengerCollection)
  - Strings
  - Arrays

- The basics of Java
We studied many ways of controlling flow through a program...

```java
int count = 0;
while (count < 5) {
    System.out.println (count);
    count++;
}
```

```java
int count = 0;
do {
    System.out.println (count);
    count++;
} while (count < 5);
```
We studied ways to structure data

- **Declaration:**
  ```java
  double[] scores = new double[10];
  ```

- **Initialization:**
  ```java
  scores[0] = 7.9;
  scores[1] = 8.7;
  scores[2] = 9.4;
  scores[3] = 8.2;
  scores[4] = 6.7;
  scores[5] = 9.8;
  scores[6] = 8.7;
  scores[7] = 8.1;
  scores[8] = 7.4;
  scores[9] = 9.1;
  ```

- The entire array has a single name
- **Index:**
  - `scores[2]`

- **Array element:**
  - This array holds 10 values of type `double` that are indexed from 0 to 9
- **Size:**
  - The size of the array is given by: `scores.length = 10`
We wrote classes that work together

- Example: managing a collection of DVD objects
We played around with GUls and Applets

Link to Project 5 applets: http://www.csc.villanova.edu/~map/1051/f13/proj5/index.html
We ran a lot of programs!

```java
//***************************************************************
// Stars.java        Author: Lewis/Loftus
//
// Demonstrates the use of nested for loops.
//****************************************************************************

public class Stars
{
    //----------------------------------------------------------------------------
    // Prints a triangle shape using asterisk (star) characters.
    //----------------------------------------------------------------------------
    public static void main (String[] args)
    {
        final int MAX_ROWS = 10;

        for (int row = 1; row <= MAX_ROWS; row++)
        {
            for (int star = 1; star <= row; star++)
                System.out.print (*");

            System.out.println();
        }
    }
}

Output
*  
** 
*** 
**** 
***** 
****** 
******* 
******** 
********* 
********** 
```

The basics of Java

- style
- comments
- identifiers
- variables
- constants
- assignment statement
- primitive types
- objects
- classes
- packages
- methods
- assignment
- arithmetic ops
- boolean ops
- casting

- algorithms
- comparison
- aliases
- formatting output
- instance variables
- visibility
- scope
- static
- return statement
- if-else
- while
- for
- do/while

- GUI classes
- Graphics
- Applets
- file input
- arrays
- arrays of objects
- 2D arrays
- from the Library
  - Strings
  - Scanner
  - Random
  - Math
  - GUI classes
- etc etc etc
So now we understand...

- What an algorithm is...
- How data can be represented and used...
- The basics of Java...
- What programming is ...
- What object-orientation is ...
- A little about computer architecture
- A way of thinking
- If we like computer science
  ... or not
Final Exam

- Similar to quizzes and midterm .. but longer
- Same material:
  - algorithms
  - writing and using classes
  - tracing code
  - coding: proper naming, indentation but commenting not needed
    - statements
    - code fragments
    - methods
    - classes
- Partial credit available
  - Be legible
  - Check your work (eg, double check that you have the right type)
- Don’t get stuck
  - Don’t write more than you are asked to write