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
  – “making change”
  – processing lists
  – processing 2D tables of data

• Fundamental data structures
  – Classes that aggregate information (eg: Account, Shoe, Person, TitanicData)
  – 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];
  ```

The entire array has a single name

• 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;
  ```

• This array holds 10 values of type `double` that are indexed from 0 to 9
• The size of the array is given by: 
  ```java
  scores.length = 10
  ```

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We wrote classes that work together

• Example: managing a collection of **DVD** objects
We played around with GUls and Applets
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
```
*  
** 
*** 
**** 
*****
******
*******
********
*********
**********
```

We ran a lot of programs!
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

• **Review session:** Mendel G86, Friday May 3, 10am -12pm.
Effect of Review Sessions

Numbers of students getting A’s, B’s, C’s and D’s or F’s

Disclaimer: This chart is totally made-up, but I needed a visual way of conveying the importance of review sessions. Although it is not based on actual data, it paints a pretty accurate picture of my observations teaching this course.
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