CS 1044

Introduction to Programming in
C/C++

Hi, My Name is...

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Lab Information

- Do not switch times
Class Info

- [http://courses.cs.vt.edu/~cs1044/spring03/mcpherson](http://courses.cs.vt.edu/~cs1044/spring03/mcpherson)
- [http://forum.cs.vt.edu](http://forum.cs.vt.edu)

What is Programming?

- Phases of Programming
  1. Design
  2. Implementation
  3. Testing
  4. Repeating
Polya’s Four Step Process

- Four steps to any problem solving activity
  1. Understand the problem
  2. Devise a solution
  3. Test the solution
  4. Rework the solution

Solving Computer Problems

- Need a tool to solve the problem
- Use a computer language to do this
- Different levels of languages*
  1. Machine Language
  2. Assembly Language
  3. High Level Language

  * Some are talking about 4th Level Languages
Algorithms

- What is an algorithm?
- A finite set of steps that specify a sequence of operations to be carried out in order to solve a specific problem.

Properties of Algorithms

1. Finiteness
2. Absence of Ambiguity
3. Definition of Sequence
4. Feasibility
5. Input
6. Output
What is a Computer?

- Made up of many independent parts all working together
  - Memory Unit
  - Arithmetic/Logic Unit (ALU)
  - Control Unit
  - Input Devices
  - Output Devices
  - Auxiliary Storage Devices

Memory Unit

- Can be thought of to look like a giant grid
- Each square in the grid is a memory location
- We can access each location in the grid, if we choose to
Ethics

- What are computer ethics?
- Piracy
  - Types of Piracy
    - Software
    - Data
    - Resources

Problem Solving Techniques

- Ask Questions
- Look for similarities
- Mean-Ends Analysis
- Divide and Conquer
- Building-Block Approach
- Merging Solutions
Quiz Time

- What are Polya’s Four Steps for problem solving?
  1. Understand the problem
  2. Devise a solution
  3. Test the solution
  4. Rework the solution