

# 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://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 4<sup>th</sup> 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
- } Central Processing Unit (CPU)

## 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