CS1001

Lecture 12
Overview

- Java Programming
Goals

- Understand the basics of Java programming
Assignments

- Brooksheer: Ch 4, Ch 5 (Read)
- Read linked documents on these slides (slides will be posted in coursework)
Language Types

- Imperative Programming
  - Java, C, C++, C#, BASIC, Visual Basic
- Functional Programming
  - SML, Lisp
- Logic Programming
  - Prolog
Imperative Programming

- Imperative programs consist of a sequence of instructions that modify the state of the machine. In other words, each instruction either performs input/output or changes physical memory (with a newly computed value).

- Each instruction (Statement) consists of:
  - Variables
  - Expressions (which in turn contain operators and variables)
Statement vs Expression

- A Statement alters the physical state of the computer. For our purposes, this will be either an output (print) statement or an assignment statement (x = y).

- An Expression represents a value; 5+3 is an expression. X+2 is an expression (assuming we know the value of X).
Statements

- Alter the machine (an assignment statement) $X = Y$ means the value represented by $Y$ should be put into memory location $X$

- Control structures
  - If/then (make a decision)
  - Loop (iterate until a condition is false)
Java Resources

- [http://home.janak.net/cs10034/resources.html](http://home.janak.net/cs10034/resources.html)
procedure Sort (List)
N ← 2;
while (the value of N does not exceed the length of List) do
  (Select the Nth entry in List as the pivot entry;
   Move the pivot entry to a temporary location leaving a hole in List;
   while (there is a name above the hole and that name is greater than the pivot) do
     (move the name above the hole down into the hole leaving a hole above the name)
   Move the pivot entry into the hole in List;
   N ← N + 1
  )