CS1001

Lecture 12

Overview

- Java Programming

Goals

- Understand the basics of Java programming

Assignments

- Brookshear: Ch 4, Ch 5 (Read)
- Read linked documents on these slides (slides will be posted in courseworks)

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://java.sun.com/docs/books/tutorial/getStarted/cupojava/index.html

Figure 4.11: The insertion sort algorithm expressed in pseudocode

```
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
    )
```