1

Types, expressions, variables, assignment statements

Summary of lectures: On course webpage, click on “Lecture summaries”.

Quote for the day:
Computers in the future may weigh no more than 1.5 tons.
--Popular Mechanics, forecasting the relentless march of science, 1949

Not getting emails from us via the CS1110 CMS? Then either:
1. You are not registered in the CMS. Email Maria Witlox mwitlox@cs.cornell.edu and ask her to register you. She needs your netid.
2. Your email is bouncing. Your Cornell email information is not set up correctly or the place to which you forward it is having trouble. Best thing to do: email yourself at netid@cornell.edu, see what happens, and fix it.

Brief interlude

From the Economist:
Teach computing, not Word:
Like philosophy, computing qua computing is worth teaching less for the subject matter itself and more for the habits of mind that studying it encourages.
The best way to encourage interest in computing in school is to ditch the vocational stuff that strangles the subject currently, give the kids a simple programming language, and then get out of the way and let them experiment. For some, at least, it could be the start of a life-long love affair.

Brief interlude (continued)

That, for me, sums up the seductive intellectual core of computers and computer programming: here is a magic black box. You can tell it to do whatever you want, within a certain set of rules, and it will do it; within the confines of the box you are more or less God, your powers limited only by your imagination. But the price of that power is strict discipline: you have to really know what you want, and you have to be able to express it clearly in a formal, structured way that leaves no room for the fuzzy thinking and ambiguity found everywhere else in life…
The sense of freedom on offer - the ability to make the machine dance to any tune you care to play - is thrilling.

Labs (“discussions”) in the ACCEL LAB 2nd floor - Mandatory
Times of the labs: Attend ONE of them.
Tuesday: 12:2, 1:25, 2:30, 3:35
Wednesday: 12:2, 1:25, 2:30, 3:35 - currently undersubscribed
ACCEL Lab: in the Engineering Library in Carpenter Hall: walk straight ‘til you come to a staircase on your left, go up the stairs.
Look for the staff, who’ll be wearing distinctive headgear.
Couldn’t register for the lab you want? Just go to the one you want this week.
Using your own laptop with DeJava installed will make it easier for everyone to fit in the room(s)!!!

New terminology

Object: a class, file drawer
Variable, field: method, function, procedure
Outputting: function call

Reading for next time: Sec. 1.3 on classes & objects
PLive: Activities 3-3.1, 3-3.2, 3-3.4 (not 3-3.3), 3-4.1, 3-4.2.
You won’t understand it. It may seem hard. It isn’t; it is just new. Scanning the section will help you become familiar with terminology and make Thursday’s lecture seem easier.
Learning steadily, in small doses, is superior to cramming every two-three weeks.

Terminology

Programming language: a language in which programs are written, usually to be executed (carried out, performed) on a computer.
Program: A set of instructions, written in a programming language, to be executed to get some task done. Like a recipe in a cookbook.
Machine language: The language of instructions that a computer is able to execute (carry out, perform).
Java Compiler: A program that translates a Java program into a machine language form so that it can be executed on a computer.
Precedence of operators (p. 23)

- Unary operators: +  –  !
- Binary arithmetic: *  /  %
- Binary arithmetic: +  –
- Arithmetic relations: <  <=  >  >=
- Equality relations: ==  !=
- Logical and: &&
- Logical or: ||

You will practice working with types and operators in Lab 01.

Type: A set of values together with operations on them.

Type double:
- values: Examples: -22.51E6 equivalent to -22510000 or -22.51 * 10^6
- 22.51E-6 equivalent to 0.00002251 or 22.51 * 10^-6

An approximation to the real numbers.

Type boolean
- values: true false
- operators: and && or ||
- Logical or: | |
- Logical and: &&

Type String
- values: Example: "the"
- operators: + (concatenation)

Variables. p. 26

- A variable is a name together with a value.
- A variable is a named box with a value in the box.

x variable x, with value 5.
It can contain an int value.

area variable area, with value 20.1.
It can contain a double value.

Declaration of a variable. p. 26

In Java, a declaration of a variable gives the name of the variable and the type of value it can contain.

- int x;
  Declaration of x, indicating that it contain an int value.
- double area;
  Declaration of area, indicating that it can contain a double value.

Assignment statement. p. 27

Execution of an assignment statement stores a value in a variable.

To execute the assignment <var>= <expr>; evaluate expression <expr> and store its value in variable <var>.

x = x + 1; Evaluate expression x+1 and store its value in variable x.

Two aspects of a programming language

- Organization – structure
- Procedural — commands to do something
  Example: Recipe book

  - Organization: Several options; here is one:
    Appetizers
    list of recipes
    Beverages
    list of recipes
    Soups
    list of recipes

  - Procedural: Recipe: sequence of instructions to carry out

Parts to this course

Structural objects
  methods
  inheritance

Procedural
  assignment, return,
  if-statement
  iteration (loops)
  recursion

Miscellaneous
  GUIs
  exception handling
  Testing/debugging