CS1110. Lecture 1, 31 Aug 2010.
Types, expressions, variables, assignment statements

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.

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

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Brief interlude

From the Economist:

Teach computing, not Word:
http://www.economist.com/blogs/babbage/2010/08/computing_schools

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.

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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.

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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 DrJava installed will make it easier for everyone to fit in the room(s)!!!

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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.

New terminology

class, file drawer	
object, instance, folder	creating a new object
variable, field	method, function, procedure
aliasing	function call, procedure call
package	importing

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Terminology

Programming language (Java, C, Fortran, Matlab, Python): 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.

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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.

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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 .00002251
or $22.51 * 10^{-6}$

mantissa **exponent**

An approximation to the real numbers.
operators: +, –, *, /, unary –

Type boolean

values: **true** **false**

operators: and && or || not !

Type String

values: Example: "the"

operator: + (*catenation*)

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Variables. p. 26

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

Memorize definition!

Write it down several times.

x | 5 | **int**

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

area | 20.1 | **double**

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

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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.

Memorize these two definitions!

Write them down several times.

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.

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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
classes
methods
inheritance

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

miscellaneous
GUIs
exception handling
Testing/debugging

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