CS100J   Fall 2006

- **CS100J:** 12 weeks of programming using Java and 2 using Matlab. David Gries.
- **CS100M:** 7 weeks of Matlab and 7 of Java. Daisy Fan.
- **CS100R:** 14 weeks Matlab, Robots, 11:15 only. Ramin Zabih

Quotes for the day:
Perhaps the most valuable result of all education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not. It is the first lesson that ought to be learned. And, however early a man's training begins, it is probably the last lesson that he learns thoroughly.
Thomas Henry Huxley (1825-95)

Whenever I start a new project, I procrastinate immediately so that I have more time to catch up. Gries

0

Reading for this and the next lecture:

Sections 1.1, 1.2, 1.3. Lab 01 will give you practice with concepts and details of 1.2, 1.3

PLive: Lesson 0, Lesson page 1.3, Activity 1-4.1.

Summary of lectures: On course home page, click on "Handouts" and then "Outline of lectures held so far".

Topics of all lectures (this may change): On course home page, click on "Syllabus".

Today:

- Introduce expressions and assignment in Java (using DrJava)

1

Recitations (Labs) Are in the Engineering ACCEL LAB

Do NOT go to the room given in the Course and Room Roster.

To get to the ACCEL Lab, go into the Engineering Library in Carpenter Hall, walk straight until you come to a staircase on your left, and go up the stairs.

Do not be concerned if you haven't been able to register for a recitation section. Just go to the one you want this week. We will straighten it out soon, so that you can register.

Here are the times of the recitation-labs: Attend ONE of them.

Tuesday: 12:2, 1:25, 2:30, 3:35

Wednesday: 12:2, 1:25, 2:30, 3:35

2

Programming Languages

- **Computer program:** set of instructions for a computer to perform, or execute. Written in a programming language.

- **Machine (computer) instructions:**
    Load memory location 60000 into register 2
    Load memory location 80310 into register 3
    Add register 2, register 3, put result in register 2
    If register 2 > 0, take next instruction from location 40000

- **Use high-level language:** Java, C, C++, Matlab, Algol 60, Lisp, Scheme, Ada, Fortran, Javascript, Python, …

- **Compiler:** translates program written in Java into a machine language.

3

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

Memorize this definition!

Write it down several times.

Type **integer**:

   values: …, −3, −2, −1, 0, 1, 2, 3, 4, 5, …

   operations: +, −, *, /, unary −

4

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

Memorize this definition!

Write it down several times.

Type **integer**:

values: …, −3, −2, −1, 0, 1, 2, 3, 4, 5, …

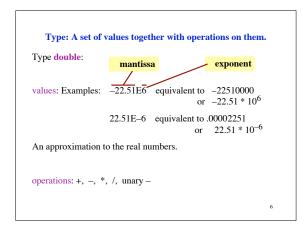operations: +, −, *, /, unary − -2^{31}. It uses 32 bits
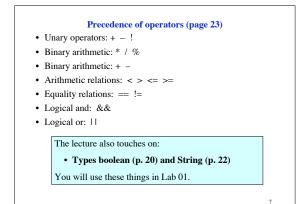
Type **int**:

values: −2147483648, −2147483647, …, −3, −2, −1,
      0, 1, 2, 3, 4, 5, …, 2147483646, 2147483647

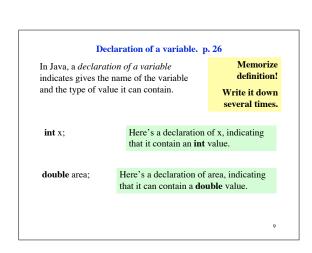operations: +, −, *, /, unary − $2^{31}-1$. It uses 32 bits

5

1

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

Type **double**:

mantissa   exponent

values: Examples: –22.51E6   equivalent to –22510000
                            or $-22.51 * 10^6$

22.51E–6   equivalent to .00002251
                 or $22.51 * 10^{-6}$

An approximation to the real numbers.

operations: +, –, *, /, unary –

6

Precedence of operators (page 23)

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

The lecture also touches on:
- **Types boolean (p. 20) and String (p. 22)**

You will use these things in Lab 01.

7

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

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

area [20.1]
        double

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

8

Declaration of a variable. p. 26

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

Memorize definition!

Write it down several times.

int x;

Here's a declaration of x, indicating that it contain an **int** value.

double area;

Here's a declaration of area, indicating that it can contain a **double** value.

9

Assignment statement. p. 27

In Java, execution of an assignment statement stores a value in a variable.

Memorize definitions!

Write them down several times.

To execute the assignment

   <var>= <expr>;

evaluate expression <expr> and store its value in variable <var>.

x= x + 1;

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

area= 25.0;

Evaluate the expression 25.0 and store its value in variable area.

10