Office Hours

- Office hours: MW 1–2 PM

- If you still cannot make it to either office hour, email me to set up an appointment if you need help with an assignment.
Today in COMP 110

- Hardware and Memory
- Programs and Compiling
- Your first program
Before Programming

- Need to know basics of a computer
  - If you want to cook, you should know basic ingredients and understand how food is prepared.

- Understand what your program is doing

- Talk intelligently about computers
Hardware vs. Software

- Hardware – physical machine
  - CPU, Memory

- Software – programs that give instructions to the computer
  - Windows XP, Google Chrome, Games, Eclipse
Hardware

- CPU (Central Processing Unit) – the “Brain”
  - GHz
    - Number of billions of instructions per second
    - I.e., how fast the computer is
  - Dual Core – multiple processing units per CPU
Memory

- Holds data for the computer
- How much the “Brain” can remember
- Main Memory
  - Memory computer uses for intermediate calculations (program you are running)
  - Disappears when you shut down your computer
- Secondary Memory
  - Disk drives, CDs, Flash drives
  - Exists until you delete it
RAM (random access memory)

- Your main memory
- 2 gigabytes of RAM
  - (Meter – unit of distance)
  - Bytes – unit of data
  - Kilobyte = 1 thousand bytes
  - Megabyte = 1 million bytes
  - Gigabyte = 1 billion bytes
What is a byte

- Smallest addressable unit of memory
- Both main memory and auxiliary memory are measured in bits
- 1 byte = 8 bits
- Bit = 0 or 1 (on or off)
- Language of the computer is bits

0 0 1 1 1 0 1 0 – 1 byte of 8 bits
Program

- Set of instructions for a CPU to follow
- Also known as software.
- You will be writing programs
  - We will look at one soon
- Hard for humans to write bits directly
Programming Languages

Your Program

Compiler

Machine Language (Bits)

High-level language (human readable)

Low-level language (computer readable)
Self-Test Questions

- What are the two kinds of memory in a computer?
- What is software?
- What is the difference between a machine-language program and a high-level language program?
import java.util.*;

public class FirstProgram {
    public static void main(String[] args) {
        System.out.println("Hello out there.");
        System.out.println("I will add two number for you.");
        System.out.println("Enter two whole numbers on a line:");

        int n1, n2;

        Scanner keyboard = new Scanner(System.in);
        n1 = keyboard.nextInt();
        n2 = keyboard.nextInt();

        System.out.println("The sum of those two numbers is");
        System.out.println(n1 + n2);
    }
}
import java.util.*;

- Package = Library of classes
  - Java.util is a package

- Different libraries give different information
  - Physics Library = Newtonian Physics
  - Music Library = your iTunes collection
  - java.util. = Allows you to read data from keyboard
public class FirstProgram
{
    public static void main(String[] args)
    {
        
        ▪ Begin a program named FirstProgram
        ▪ Program names should make sense
        ▪ Another name for this program could be
          ▪ AddTwoNumbers

        ▪ You should always capitalize the first letter of each word in your program name
Output to screen

System.out.println("Hello out there.");
System.out.println("I will add two numbers for you.");
System.out.println("Enter two whole numbers on a line:");

- Write what is in quotes to screen
Class, Object, Method

- Class – Category of Objects
  - E.g., Stapler

- Object – A specific member of that category
  - E.g., My red Swingline

- Method – Actions performed by objects
  - E.g., Staple pages, load staples, fix jam, etc.
Invoke methods on objects

- myRedSwingLine.fixJam();
- ramses.eatGrass();
- System.out.println("Hi");
Variable

int n1, n2;

- Variable - store piece of data
- n1 - store integer
- n2 - store integer
Create Scanner Object

Scanner keyboard = new Scanner(System.in);

Create object (keyboard) of Scanner class

Stapler myRedSwingLine = new Stapler();
Read an integer from the keyboard and store it in n1

n1 = keyboard.nextInt();
System.out.println("The sum of those two numbers is");

Add n1 and n2
Print the sum to the screen
import java.util.*;

public class FirstProgram {
    public static void main(String[] args) {
        System.out.println("Hello out there.");
        System.out.println("I will add two number for you.");
        System.out.println("Enter two whole numbers on a line:");

        int n1, n2;

        Scanner keyboard = new Scanner(System.in);
        n1 = keyboard.nextInt();
        n2 = keyboard.nextInt();

        System.out.println("The sum of those two numbers is");
        System.out.println(n1 + n2);
    }
}
Hello out there.
I will add two numbers for you.
Enter two whole numbers on a line:
12 30
The sum of those two numbers is 42
Before Tomorrow

- Eclipse
- Your first java program
- Download and Install Eclipse **before** lab (see webpage)
- Go through the Eclipse Tutorial on your own
- Get the textbook!
- Read 1.1–1.3