Lecture 1: Computers & Programming

Hardware

- Processor: CPU & ALU
- Memory: bits & bytes
- Peripherals
    - Input/Output
    - Secondary Memory

Software

- Programs
    - Algorithms
    - Instructions
    - Data
- Source vs. Executable Code
- Programming Languages
    - High vs Low Level
    - Syntax
- Data Representation
    - Numbers
    - Text

Java & Object-Oriented Programming

- Classes
- Objects

Program Statements & Syntax

- Program Structure
    - Classes & Methods
    - Code Blocks
- Comments
- Expressions
- Instructions
    - Declarations
        - Variables vs. constants
        - Primitives vs. objects
    - Assignments
    - Method Calls

Program examples:

```
import java.util.Scanner;

public class CalculateHourlyPay {
    public static final int WEEKS = 52; // weeks per year
    public static final int HOURS = 40; // hours per work week
    public static void main (String [] args) {
        Scanner kb = new Scanner(System.in);
        double salary;      // amount paid per year: input
        double hourlyPay;   // amount paid per hour: calculated
        // Get salary from user:
        System.out.print("What is your yearly salary? ");
        salary = kb.nextDouble();
        // Calculate hourly pay:
        hourlyPay = salary / (WEEKS * HOURS);
        // Output results:
        System.out.println("Based on your salary of $" +
            salary + ", you make $" + hourlyPay +
            " per hour (before deductions).");
    }
}
```

```
import java.util.Scanner;
public class PigLatin {
    public static void main(String [] args) {
        Scanner kb = new Scanner(System.in);
        String wordb4,     // word entered by user
           firstL,         // first letter of word
           wordAfter;      // word after translation
        System.out.print("Enter a word: ");
        wordb4 = kb.next();
        // Isolate first letter of word:
        firstL = wordb4.substring(0,1);
        // reconfigure word without first letter:
        wordb4 = wordb4.substring(1);
        // construct back half of new word:
        wordAfter = firstL + "ay";
        // put new word together:
        wordAfter = wordb4 + wordAfter;
        // Output results:
        System.out.println("Your word " + firstL + wordb4 + " is " +
            wordAfter + " in Pig Latin.");
    }
}
```