Introduction to Programming

with Java, for Beginners

Sequential Programming
Java Compiler and VM
Java Program Structure

Recall:Statements

- Describes a behavior
  - End with semicolon(;)
- Examples:
  - Declaration and Initialization statement
    - **int x = 560 * 9;**
  - Printing to output screen
    - **System.out.println("x = " + x);**

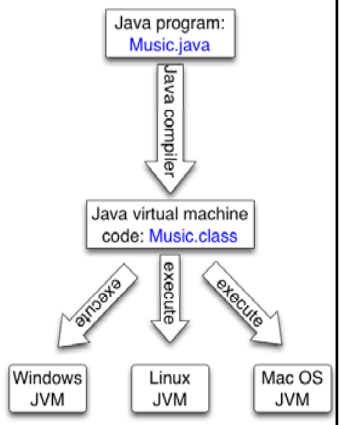
Sequential Programming

- Computer executes statements in the order the statements are written
- Example:

```
Welcome to Dr. Java
> int num = 2;
> int sqNum = num * num;
> System.out.println(sqNum);
```

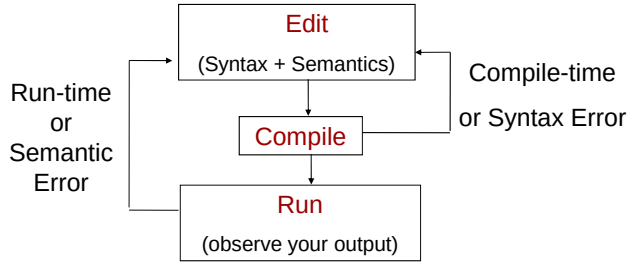

Java Compiler and Virtual Machine

- The Java Compiler
  - Reads file with extension ***.java***
  - Checks syntax / grammar
  - Creates a ***.class*** file which contains ***byte***(or machine) code independent of any machine
- Java Byte Code
  - **Is *portable***
- JVM(Java Virtual Machine)
  - Translates *byte code* in to instructions (actual machine code) for a particular processor
  - The actual machine code then is executed on the computer



Process of Computer Programming

- Programming Cycle



- Philosophy: program in increments

Java Program Structure

- Consist of one of more file ending ***.java***
- Each file has the following structure

```
public class Classname {
  ...
}
```

- Filename and Classname ***must exactly match***
- The curly braces { } define start and end of class description
  - Syntax error if the brace pair is missing
- Classname
  - Must start with alphabet – Java Rule
  - The first letter must capital – Style Rule
  - Can be made up of alphanumeric characters and underscore

Special Syntax

- Within any one class description if we have the special syntax

```
public static void main (String[ ] args) {
  statement(s)
}
```

- This known as a program's (computational solution) entry point i.e. where it starts getting executed
  - Called the ***main*** method
  - A method is a ***named*** group of statements
  - For now ignore keywords, public, static and void, String [] args

Example Hello.java

```
public class Hello{
  public static void main(String[] args){

    // A statement that prints to output screen
    System.out.println("Hello World");

  }// end of main
}
```

Sequential Programming (contd..)

```
public class PrintSquare{
   public static void main (String [ ] args){
      int num = 2;
      int sqNum = num * num;
      System.out.println("sqNum =" + sqNum);
   }
}
```

Note: For now all statements must be inside the main method