INTRODUCTION

Chapter 1

Java

- Difference between Visual Logic & Java
  - Lots
  - Visual Logic
    - Flowcharts
    - No writing code
    - VL did it behind scenes
  - Java
    - Writing code
    - High-level language

High-level Programming Languages

- Began to appear in mid 1950s
- English like
- Programmer expressed the idea
- You biggest job
  - Solve the problem at hand
- Special program translated into machine language - compiler

Java Example

```
If (intRate > 100)
    System.out.println("Interest rate error");
```

If the interest rate is over 100, display an error message. What will be displayed is "Interest rate error"

Java Programming Language

- Began in 1991
- James Gosling and Patrick Naughton at Sun Microsystems
- Originally called Green
- Designed to be used in consumer devices not as a main line programming language
- No customer was found
- 1994 – rewrote into current browser based Java

Java Features

- Lots of code already written to perform routine tasks
- Portable code
  - Not dependent on a specific architecture
- Designed for Internet
- Built in security features

Technicality

- There is a certain structure that must be followed
- Some will be explained as we go
- Some will have to wait till we understand more

IDE

- Integrated Development Environment
- Write and test your commands in one location
- We will use Blue Jay in lab

Understanding Files and Folders

- File – collection of items of information
  - Programs are kept in files
  - Should end in .java
  - Example Test.java
  - Names can not contain spaces
  - Case sensitive
    - Test.java not = test.java
- Keep you files and back them up
- Do not store on the computer

Java
Hello World Example

Simple Program

```
public class HelloTester
{
        public static void main(String[] args)
        {
                // Display a greeting in the console window

                System.out.println("Hello, World!");

        }
}
```

Output:

```
Hello, World!
```

Java Program

- Case sensitive
  - Caps and lower case do matter
  - Variable1 different from variable1
- Free-form layout
  - White space doesn't matter
  - Looks for ; to say it's the end of a line
  - Can string lines together
    - Not recommended
    - I'll take off points
  - Code needs to be indented

Java Speak

- Visual Logic gives foundation for logic
- Java will be programming
- We will use different words
- We will define things in terms of classes and methods
- Don’t let the words throw you off.

Dissect Simple Program

- public *class* HelloTester

- Starts a new class
  - Designated by the word class
  - Every program consists of one or more classes
    - Generally more than one
  - Will study classes in the next chapter
  - For now accept that this is a class

Dissect Simple Program

- public class HelloTester

- public
  - Designates who can use the class
  - Usable by everyone
  - Another case of we will explain later

Dissect Simple Program

- public class HelloTester

- HelloTester
  - Class name
  - HelloTester must be contained in a file HelloTester.java
  - The class name and the file name must match
  - Remember – capitalization counts

Simple Program

```
public class HelloTester
{
        public static void main(String[] args)
        {
                // Display a greeting in the console window

                System.out.println("Hello, World!");

        }
}
```

Dissect Simple Program

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

Defines a method called **main**

A method contains a collection of programming instructions that describe how to carry out a particular task

Every java application must have a main.

Most have additional methods

Dissect Simple Program

public static void main **(String[ ] args)**

String[ ] args

- Required part of the main method
- Command line arguments
- Allows us to give program information it needs to run
- The () indicates that what is contained inside is an argument
  - Sometimes they are empty
  - Will discuss details later (much later)

Dissect Simple Program

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

        }
}
```

So far all this code does is build a framework! It really doesn’t perform any action that you can see or know is being done. The book calls it the plumbing! This piece of code is necessary to add code to perform an action.

The Simple Program Heart

// display a greeting in the console window

This particular line is a comment. It is designed to help the programmer know what is happening with a piece of code. No execution takes place. It is not executed by the compiler.

It is a good idea to comment you code.

I require it!

The comments are generally for blocks of code and not individual lines.

The Simple Program Heart

System.out.println("Hello, World!");

This is where your action takes place.
Need to specify the output is to go to the console.

The Simple Program Heart

```
System.out.println("Hello, World!");
```

System.out is what is called an object.

println is a method telling Java what is to be done to the object System.out

“Hello World!” is a parameter being passed to System.out that tell it what to print to the console.

Analogy

- System.out is an object
- Pen is an object

- println is a method or what the object is to do
- Write is an method or what the object is to do
- (Hello, World!) is the parameter that tells us to write the words   Hello, World!

Variables

- Java is what is called a typed language.
  - That means we have to tell the computer what kind of variables we are going to have.
  - Remember in Visual Logic we just assigned a string or an integer to a variable and it was ok.
  - Not so in java.
  - We have to tell it what kind of variable we have.
  - Different kinds of variables behave differently.
  - Let's look at some examples.

What Will These Print?

- System.out.println(3+4);
  - 7
- System.out.println(“3+7”);
  - 3+7
- System.out.print(“00”);
- System.out.println(7);
  - 007
- **System.out.println(“Hello”);**
- **System.out.println(“World”);**

Errors

- What happens when you make a typo?
  - Depends
  - Compile-time or syntax error
    - Think of these types as grammar errors in English
  - Logic error
    - Think of these as word problems in Math

Syntax Error

```
System.ouch.println(“Hello World!”):
```

ouch – misspelling
- flag by compiler
- error message

: – should be ;
- may or may not compile

Logic Error

System.out.println ("Hello, Word!");

This one will compile and will run. You won' t get the results you want!

These types are more difficult to find and fix!

Making the Program run

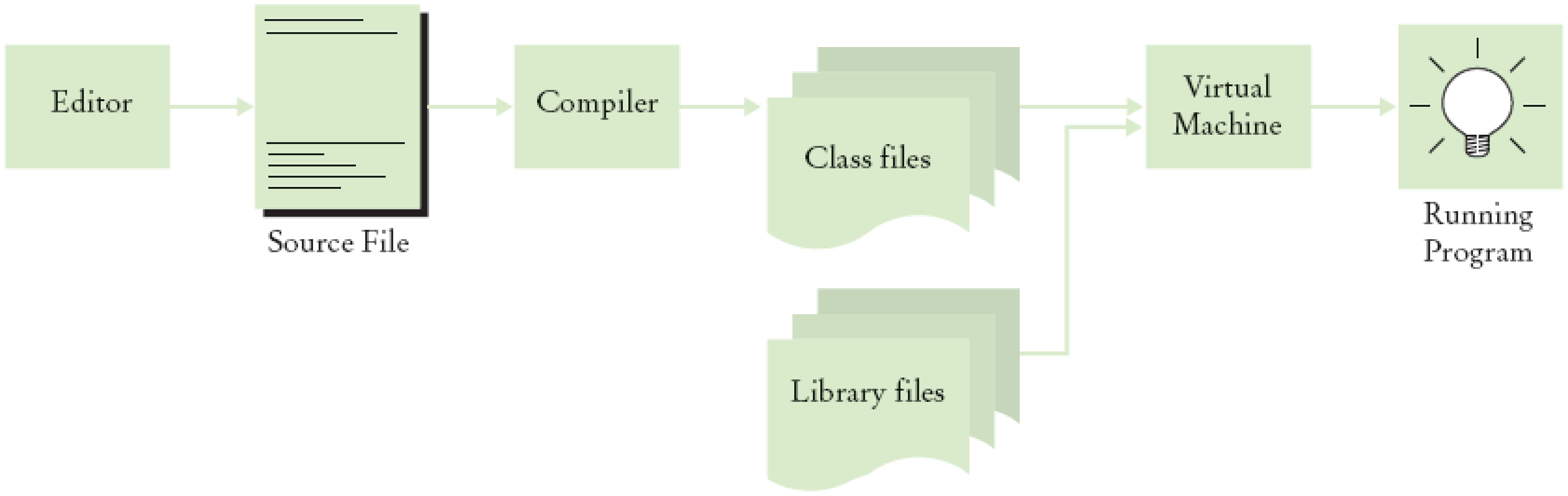

Figure 14 From Source Code to Running Program

Java and BlueJ

- Free software
- Must download Java before BlueJ
- Java go to

http://java.sun.com/javase/downloads/index.jsp

  - You want to download the JDK NOT the JRE.
- **Java SE Development Kit (JDK) Bundles**
- **JDK 6 Update 20 with Java EE**

- BlueJ go to

http://www.bluej.org/download/download.html