Java Workshop CSI W99

Department of Mathematics and Computer Science
Bronx Community College

July 5, 2017

Java Workshop Day 1

Recommended Textbook (optional)

Java How To Program, 10th Edition-Early Classes/Objects
Deitel and Deitel

Java Workshop Day 1

JDK SE Includes

Java Runtime Environment (JRE) Minimum requirement

Java Virtual Machine (JVM).

Compiler

javac classname.java (creates classname.class)

Interpreter for executable classes

java classname (executes classname.class)

SE Version of JDK is Sufficient for learning Java

JDK EE is for commercial production

JDK SE Includes

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Download JDK SE

Download JDK SE From Oracle's Website

http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html

Java SE Development Kit 8u131

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

◉ Accept License Agreement ○ Decline License Agreement

Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	77.87 MB	jdk-8u131-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	74.81 MB	jdk-8u131-linux-arm64-vfp-hflt.tar.gz
Linux x86	164.66 MB	jdk-8u131-linux-i586.rpm
Linux x86	179.39 MB	jdk-8u131-linux-i586.tar.gz
Linux x64	162.11 MB	jdk-8u131-linux-x64.rpm
Linux x64	176.95 MB	jdk-8u131-linux-x64.tar.gz
Mac OS X	226.57 MB	jdk-8u131-macosx-x64.dmg
Solaris SPARC 64-bit	139.79 MB	jdk-8u131-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	99.13 MB	jdk-8u131-solaris-sparcv9.tar.gz
Solaris x64	140.51 MB	jdk-8u131-solaris-x64.tar.Z
Solaris x64	96.96 MB	jdk-8u131-solaris-x64.tar.gz
Windows x86	191.22 MB	jdk-8u131-windows-i586.exe
Windows x64	198.03 MB	jdk-8u131-windows-x64.exe

Install JDK SE

Install the JDK

Run the resulting downloaded executable file, for example, jdk-8u131-windows-x64.exe. This will install the JDK.

Eclipse is an Integrated Development Environment

Editor

Configure indentation, tabbing, syntax coloring, etc..

Instant Compiler

Translates Java code as you type it.

Debugger

Helps find programming errors by stepping through a program.

Multiple views and perspectives

Manages complexity of a program.

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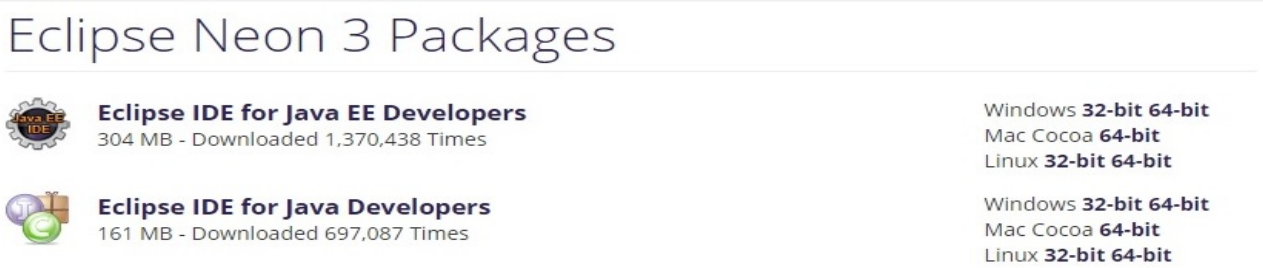
Download Eclipse for Java SE

From Eclipse Website

http://www.eclipse.org/downloads/packages/release/Neon/3
Do NOT select Java EE—Use the other (for Java Developers)



Install Eclipse IDE for Java SE

Unzip Eclipse

Unzip the resulting file that is downloaded, for example,
eclipse-java-neon-3-win32-x86_64.zip,
into a folder from which you want to run the eclipse.exe executable

Java Workshop Day 1

Hello

A Java File Defines a Class

```
/* Hello.java
* prints "Hello" message on console
* George Leibman
* Day 1
* July 5, 2017
*/
public class Hello
{
   public static void main(String[] args)
   {
      System.out.println("Hello");
   }
}
```

Hello

There Must Be a "main" Method

```
/* Hello.java
* prints "Hello" message on console
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public class Hello
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   public static void main(String[] args)
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}
```

Hello

Keywords Used in Class Definitions

```
/* Hello.java
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*/
public class Hello
{
   public static void main(String[] args)
   {
      System.out.println("Hello");
   }
}
```

Welcome

Welcome

```
/* Welcome.java - reads input and responds */
import java.util.Scanner;
public class Welcome
{
   public static void main(String[] args)
   {
      String name;
      System.out.print("Please enter your name:  ");
      Scanner input = new Scanner(System.in);
      name = input.next();
      System.out.println("Welcome to Java "+name+"!");
   }
}
```

Welcome

Variable Declarations

```
/* Welcome.java - reads input and responds */
import java.util.Scanner;
public class Welcome
{
   public static void main(String[] args)
   {
      String name;
      System.out.print("Please enter your name:  ");
      Scanner input = new Scanner(System.in);
      name = input.next();
      System.out.println("Welcome to Java "+name+"!");
   }
}
```

Welcome

Need to Import Package java.util, not java.lang

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/* Welcome.java - reads input and responds */
import java.util.Scanner;
public class Welcome
{
   public static void main(String[] args)
   {
      String name;
      System.out.print("Please enter your name:  ");
      Scanner input = new Scanner(System.in);
      name = input.next();
      System.out.println("Welcome to Java "+name+"!");
   }
}
```

Add

Add

```
/* Add.java - reads input and calculates output */
import java.util.Scanner;
public class Add
{
   public static void main(String[] args)
   {
      int a, b;
      System.out.print("Please enter two integers: ");
      Scanner input = new Scanner(System.in);
      a = input.nextInt();
      b = input.nextInt();
      System.out.printf("The sum is %d", a+b);
   }
}
```

Java Workshop Day 1

Primitive Types are Similar to C++ Types

Sizes the Same in Java (Different in C++)

- `int` integer (32 bits)
- `short` integer (16 bits)
- `long` integer (64 bits)
- `float` real (32 bits IEEE)
- `double` real (64 bits IEEE)
- `char` text (16 bits unicode)
- `byte` binary data (8 bits)
- `boolean` true or false (size depends on JVM)

Other Syntax Similar to C++

Statement Syntax

- Semicolons after every statement.
- Blocks of code in curly braces.
- Same keywords for control structures and functions.
- All local variables must be declared.

Type Differences with C++

All non-primitive data values are

- **References** to (i. e., implicit addresses of)
- **Objects** (instances of some class).
- Java has no **pointer types** (explicit addresses of data).

Memory is better managed

- Fewer memory leaks or allocation errors, since no there is no explicit pointer (memory address) datatype.
- Garbage collection periodically frees up unused memory references.

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Arithmetic Operations

All Numeric Types: int, short, long, float, double

- + add
- - subtract
- * multiply
- / divide
- % remainder (mod)

Assignment Operations

Return the value of the left-hand side (lhs)

- Simple Assignment: = returns the value of the left-hand side.
  So
  ```
  a = b = c;
  ```
  is the same as
  ```
  b = c;
  a = b;
  ```
- Compound Assignment (+=, -=, *=, /=, %=):
  `a += 3;` is shorthand for `a = a + 3;`

Increment/Decrement Operations

Similar to `i += 1` and `i -= 1`

- `i++, i--` postfix increment/decrement - return old value of `i`
- `++i, --i` prefix increment/decrement - return new value of `i`

Comparison Operations

Return type `boolean` (true or false)

- `<`, `>`, `<=`, `>=`, `!=`, `==`

Boolean Operations

Operand and Return type boolean

- && and
- || or
- ! not