Basics of Java

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Overview

1. History of Java
2. Using Java for CS50 Final Projects
3. Writing, Compiling and Running .java using Eclipse IDE
4. Coding and Debugging in Java
5. Other Resources

Compiling Java Programs

Step 1: Compiler turns Java code into byte-code

NOTE: byte-code is machine language of JVM.

Step 2: Interpreter turns byte-code into machine code for all

WHY?

Portability: write once, run everywhere

- Once compiled, byte-code can be sent over the Internet.
- No need to recompile if on another computer.
- Operating System differences bypassed

uses of java

1. Internet Applications
2. Android App. Development
3. JavaServer Pages (JSP)
4. Mobile Information Devices Profile (MIDP)

Using Eclipse IDE for Java

- The Integrated Development Environment (eg. Netbeans)
- Compiles upon saving (no need for Terminal commands)

Steps:

#1. Download Java Runtime Environment

#2. Download Eclipse itself

... Let the coding begin

Object Oriented Programming Language

- Java consists of
  - Classes
    - descriptions of objects (blueprint)
    - describes structure containing methods.
  - Object
    - realization of what the class described
    - instantiazed class
    - have associated methods

Remember:

Java is an object oriented programing language

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

Class name and file name should be fully IDENTICAL

Data Types in Java

Class Types:

Blue-prints for objects
Specifies how data included in a class is dealt with
Eg. String

Primitive Types

Eg: Variables
Value is a single number or letter.

Primitive Data Types

Type Name	Kind (of Value)	Memory
byte	integer	1 byte
short	integer	2 bytes
int	integer	8 bytes
float	floating-point	4 bytes
double	floating-point	8 bytes
char	single-char	2 bytes
boolean	true/false	1 bit

STYLE: Legality of Identifier Names

Class Type:

YourBook
MyFullName

Primitive Type:

myFirstInitial
teamNumber
days_Per_Week

Constants

public static final Type Variable = Constant

public static final double PI = 3.14159;

Type Variable = Constant;

double PI = 3.14159;

Type Casting in Java

```
int speed = 4.42;
int points = (int) speed;
```

NOT: int points = speed;

Type Casting in Java

```
double speed = 4.42;
int points = (int) speed;
```

NOT: int points = speed;

Char To Int

```
char symbol = '7';
System.out.println((int)symbol);
```

Order of Precedence in Java

1. Unary operations +, - , !, ++ and --
2. Binary arithmetic operations *, / and %
3. Binary arithmetic operations
   + and -

Flow of Control

- Very similar to C
- if-else, while, do-while all exist in Java
- ==, !=, <= and >= are same as in C
- System.exit (0) vs break;

Making Final Projects

Make your own objects

Making Objects For Yourself

Use constructors and methods (either public or private)

Use multiple classes made within the same directory.

These classes can be re-usable!

Resources:

1) Java Class Library

2) Java: An Introduction to Problem Solving and Programming
   By: Walter Savitch
   (see Cabot Library)

3) Java Programming: A Back to Basics Approach
   By: Stuart Reges and Marty Stepp

4) Email me at: rabeea_ahmed@college.harvard.edu

Thank You!