CMPS 4143 - Topics in Contemporary Programming Languages

L1- Java Intro, SDK, Fundamentals

Images and text taken from textbook unless otherwise noted.

Java “White Paper” Buzzwords

Simple	Object-Oriented
Distributed	Robust
Secure	Architecture-Neutral
Portable	Interpreted
High-Performance	Multithreaded
Dynamic	

Java History

Sun engineers, led by Patrick Naughton and James Gosling in 1991 – Green team-https://www.javatpoint.com/history-of-java

First Version of Java 1.0 – 1996

J2SE 5.0 (30th Sep 2004)

Java SE 6 (11th Dec 2006)

Java SE 7 (28th July 2011)

Java SE 8 (18th Mar 2014)

Java SE 9 - Java SE 16 (Mar 2021)

Java SE 17 (September 2021)

Evolution of Java

Table 1.1 Evolution of the Java Language

Version	Year	New Language Features	Number of Classes and Interfaces
1.0	1996	The language itself	211
1.1	1997	Inner classes	477
1.2	1998	The `strictfp` modifier	1,524
1.3	2000	None	1,840
1.4	2002	Assertions	2,723
5.0	2004	Generic classes, "for each" loop, varargs, autoboxing, metadata, enumerations, static import	3,279
6	2006	None	3,793
7	2011	Switch with strings, diamond operator, binary literals, exception handling enhancements	4,024
8	2014	Lambda expressions, interfaces with default methods, stream and date/time libraries	4,240

Common Misconceptions about Java

Extension of HTML

I use XML, I don't need Java

JavaScript is simpler version of Java

Java Jargons

Table 2.1 Java Jargon

Name	Acronym	Explanation
Java Development Kit	JDK	The software for programmers who want to write Java programs
Java Runtime Environment	JRE	The software for consumers who want to run Java programs
Server JRE	—	The software for running Java programs on servers
Standard Edition	SE	The Java platform for use on desktops and simple server applications
Enterprise Edition	EE	The Java platform for complex server applications
Micro Edition	ME	The Java platform for use on cell phones and other small devices
Java FX	—	An alternate toolkit for graphical user interfaces that is included in Oracle's Java SE distribution
OpenJDK	—	A free and open source implementation of Java SE. It does not include browser integration or JavaFX.
Java 2	J2	An outdated term that described Java versions from 1998 until 2006
Software Development Kit	SDK	An outdated term that described the JDK from 1998 until 2006
Update	u	Oracle's term for a bug fix release
NetBeans	—	Oracle's integrated development environment

Java Jargons

Extension of HTML

I use XML, I don’t need Java

JavaScript is simpler version of Java

Java with VSCode

https://www.java.com/en/download/

https://code.visualstudio.com/

https://code.visualstudio.com/docs/java/java-tutorial

Fundamental Programming Structure in Java

MSU TEXAS

- Simple Program
- Comments
- Data Types
- Variables
- Operators
- Strings
- Array

Simple Program

```
Public class HelloWorld{
    Public static void main(String [] args){
        System.out.println("Hello World")
    }
}
```

- Case sensitive
- Naming convention: CamelCase
- Filename : HelloWorld.java
- Object.method: `System.out.println("Hello World")`

Comments

- Three types of commenting
  - //
  - /**/
  - /** */

```
/**
     * This is the program to say hello to the world
     * @version used:
     * @author Jon Doe
*/
Public class HelloWorld{
     Public static void main(String [] args){
          System.out.println("Hello World")
     }
}
```

Data Types

- Integers: int (4) , short (2), long (8), byte(1)
- Floating Points: float (4), double (8)
- 3 floating point values: +INF, -INF, NaN
- Chars: \b, \t, \n, \r, \””, \’, \\
- Boolean: true, false

Variables

Each variable has a type

```
double salary;
int vacationDays;
long earthPopulation;
boolean done;
```

Variable initialization

```
double salary;
System.out.println(salary);
// Error: variable not initialized

int vacationDays;
vacationDays = 12;

int vacationDays = 12;
```

Constant Variable

```
Public class HelloWorld{
     Public static void main(String [] args){
          final double PI = 3.1415926535
          System.out.println("Hello World")
     }
}
```

```
Public class HelloWorld{
     public static final double PI = 3.1415926535
     Public static void main(String [] args){
          System.out.println("Hello World")
     }
}
```

Operators

+ - * /

Integer division when both arguments are interger
Otherwise floating point division

```
int a= 10;
int b= 2;
int c= 2.5;

int d = a/b;
int e = a/c;
```

Strings

```
String e = “”;
String greeting = “Hello”;
```

Substring

```
String s = greeting.substring(0, 3);
//Hel
```

Strings are Immutable

```
String s = greeting.substring(0, 3) + “p!”;
//Help
```

Concatenation

```
String a =“Hello”;
String b =“World”;
String c =a + b;
//Hello World
```

Popup quiz

```
int a = 1;
int b = 2;
int c = a+b;
// 3

int a = '1';
int b = '2';
int c = a+b;
//12
```