HNDIT3012 Object Oriented Programming

Lecture 02 – Fundamentals of java (a revision)

First Program

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

- Save with **.java** extension
- If a public class is present, the class name should match the file name

The Key words meaning

- **class** - used to declare a class in java.
- **public** - an access modifier which represents visibility, it means it is visible to all.
- **Static -** used to create static method. no need to create object to invoke the static method
- **void** - is the return type of the method
- **Main -** represents startup of the program.
- **String[] args -** used for command line argument.
- **System.out.println()-** used print statement.

Variables

- A variable is a container which holds the value while the Java program is executed.

- It is assigned with a data type.
- Variable is a name of memory location.

- There are three types of variables in java:
  - local, instance and static.

- There are two types of data types in Java:
  - primitive and non-primitive.

Variables

- Local Variable
  - A variable declared inside the body of the method
  - You can use this variable only within that method and the other methods in the class aren't even aware that the variable exists.
  - A local variable cannot be defined with "static" keyword.

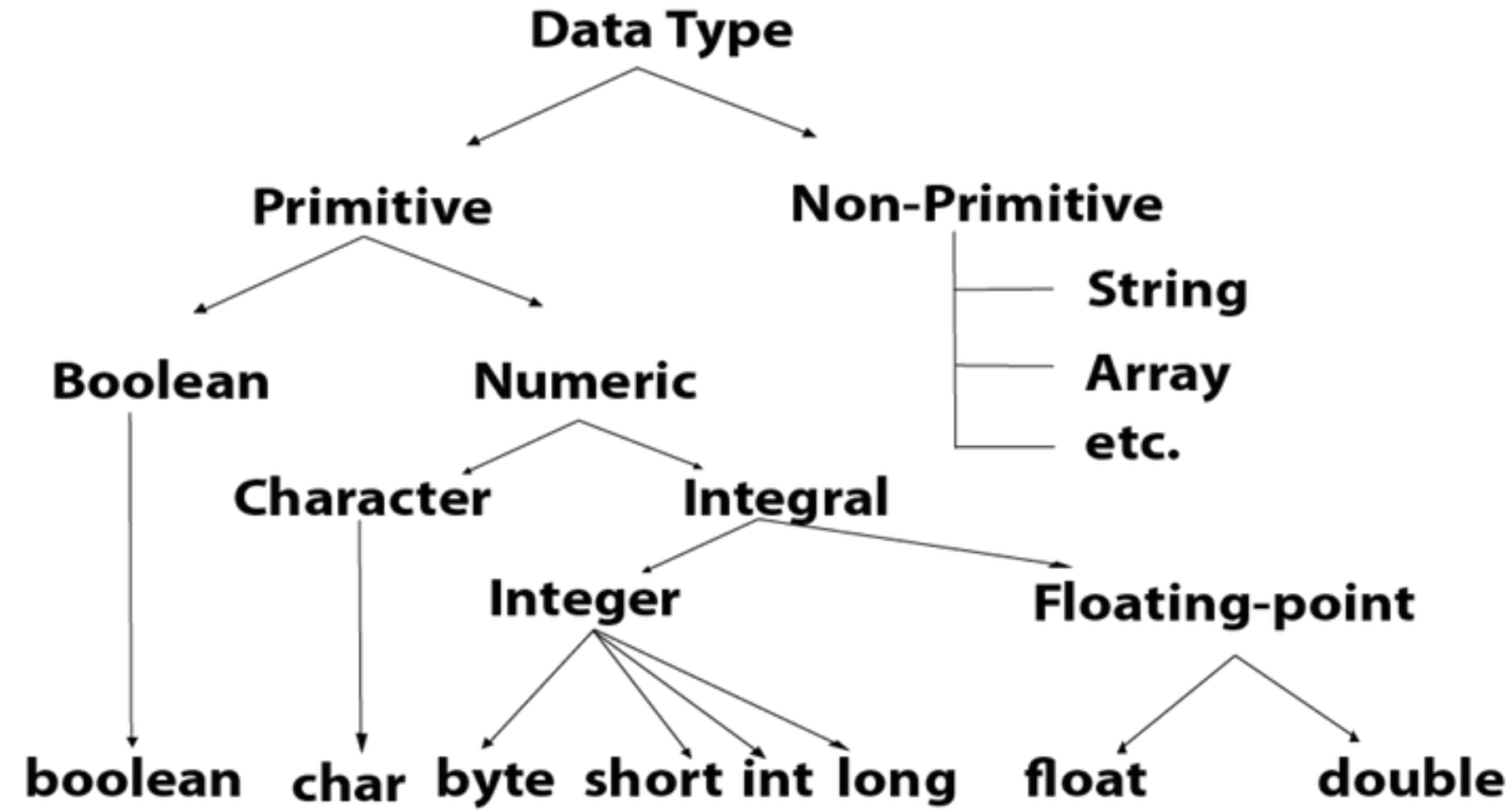
- Instance Variable
  - A variable declared inside the class but outside the body of the method, is called an instance variable. It is not declared as static
  - It is called an instance variable because its value is instance-specific and is not shared among instances.

- Static variable
  - A variable that is declared as static is called a static variable.
  - It cannot be local.
  - You can create a single copy of the static variable and share it among all the instances of the class.
  - Memory allocation for static variables happens only once when the class is loaded in the memory.

Example

```
1.public class A
2.{
3.     static int m=100;//static variable
4.     void method()
5.     {
6.          int n=90;//local variable
7.     }
8.     public static void main(String args[])
9.     {
10.         int data=50;//instance variable
11.    }
12.}//end of class
```

Data Types in Java



Data Types in Java

Data Type	Default Value	Default size
boolean	false	1 bit
char	'\u0000'	2 byte
byte	0	1 byte
short	0	2 byte
int	0	4 byte
long	0L	8 byte
float	0.0f	4 byte
double	0.0d	8 byte

Operators in Java

- Unary Operator
- Arithmetic Operator
- Shift Operator
- Relational Operator
- Bitwise Operator
- Logical Operator
- Ternary Operator
- Assignment Operator

Java Operator Precedence

Operator Type	Category	Precedence
Unary	postfix	*expr++ expr--*
	prefix	*++expr --expr +expr -expr* ~ !
Arithmetic	multiplicative	* / %
	additive	+ -
Shift	shift	<< >> >>>
Relational	comparison	< > <= >= instanceof
	equality	== !=
Bitwise	bitwise AND	&
	bitwise exclusive OR	^
	bitwise inclusive OR	|
Logical	logical AND	&&
	logical OR	||
Ternary	ternary	? :

Question 01

Java Unary Operator Example: ++ and --

```
public class OperatorExample{
    public static void main(String args[]){
        int x=10;
        System.out.println(x++);
        System.out.println(++x);
        System.out.println(x--);
        System.out.println(--x);
    }
}
```

Output:

10
12
12
10

Question 02

Java Arithmetic Operator Example

```
public class OperatorExample{
    public static void main(String args[]){
        int a=10;
        int b=5;
        System.out.println(a+b);
        System.out.println(a-b);
        System.out.println(a*b);
        System.out.println(a/b);
        System.out.println(a%b);
    }
}
```

Output:

15
5
50
2
0

Question 03

Java Arithmetic Operator Example: Expression

```
public class OperatorExample{
    public static void main(String args[])
    {
        System.out.println(10*10/5+3-1*4/2);
        System.out.println (5+15/3*2-8%3  );
        System.out.println((55+9)%9)
        System.out.println(20+-3*5/8)

    }
}
```

Output
21
13
1
19

Question 04

Java Assignment Operator Example

```
public class OperatorExample{
    public static void main(String[] args){
        int a=10;
        a+=3;
        System.out.println(a);
        a-=4;
        System.out.println(a);
        a*=2;
        System.out.println(a);
        a/=2;
        System.out.println(a);
    }
}
```

Output:

```
13
9
18
9
```

Question 05

Java Ternary Operator Example

```
public class Operator{
    public static void main(String args[]){
        int a=2;
        int b=5;
        int min=(a<b)?a:b;
        System.out.println(min);
    }
}
```

Question 06

```
public class OperatorExample{
    public static void main(String args[]){
        int a=10;
        int b=5;
        int c=20;
        System.out.println(a<b && a<c);
        System.out.println(a>b||a<c);
        System.out.println(a>b||a++<c);
        System.out.println(a);
    }
}
```

Question 07

- Write a Java program to swap two variables.

Question 08

- Write a Java program to convert temperature from Fahrenheit to Celsius degrees.
  If Fahrenheit is 212 e*xpected Output is* 100.0 in Celsius
- F = (9C + (32 * 5))/5