JAVA BASICS

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Transitioning C++ to Java
JAVA

- Another programming language just like C++.
- All source files ends with *.java extension.
- Compiled using Java Compiler
  (current stable version JDK8)

**Recommended Text Editors:**

- Windows – Notepad++/Sublime
- MAC – Sublime/TextWrangler
DECLARING VARIABLES

C++

```cpp
int num = 4;
double dnum = 123.04;
string new = "lowercase s";
float fahrenheit = 98.7f;
bool flag = true;
char c = 'c';
```

Java

```java
int num = 4;
double dnum = 123.04;
String new = "uppercase s";
float fahrenheit = 98.7f;
boolean flag = true;
char c = 'c';
```
# OPERATORS

<table>
<thead>
<tr>
<th>Category</th>
<th>Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>= += -= *= /= %= &amp;=</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>+ - * / %</td>
</tr>
<tr>
<td>Relational</td>
<td>&lt; &gt; &lt;= &gt;=</td>
</tr>
<tr>
<td>Equality</td>
<td>== !=</td>
</tr>
<tr>
<td>Logical AND</td>
<td>&amp;&amp;</td>
</tr>
<tr>
<td>Logical OR</td>
<td></td>
</tr>
<tr>
<td>Logical NOT</td>
<td>!</td>
</tr>
</tbody>
</table>
OUTPUT TO CONSOLE

C++

cout << “Prints to the same line.”;
cout << “Prints a newline to screen.\n”;  
cout << “Prints a newline and flushes buffer.” << endl;

Java

System.out.print ("Prints to the same line.");
System.out.print ("Prints a newline to screen.\n");
System.out.println ("Prints a newline and flushes buffer.");
C++

```cpp
cout << x; // printing variables
cout << “x =” << x; // string and variable separated by << operator for concatenation
```

Java

```java
System.out.print (x); // printing variables
System.out.print (“x = ” + x); // + operator is used as concatenation for printing
System.out.print (“x = ” + “y”); // concatenation of two strings
System.out.println (“The sum of x and y is ” + (x + y)); // (x + y) are arithmetic addition within parentheses, then concatenated to the rest of the string
```
### IF STATEMENTS

```java
if (boolean_expression)
    do something

if (boolean_expression)
    do something
else
    do something

if (x == 5)
    System.out.println ("x is 5");

if (x == 5)
    System.out.println ("x is 5");
else
    x = x + 10;
```
if (boolean_expression)
    do something

else if
    (boolean_expression2)
    do something

else
    do something

if (x == 5)
    System.out.println ("x is 5");
else if (x == 10)
    x++;
else
    x *= y;
**LOOP**

initialize loop variable

while (boolean_expression) {
  do something
  updating loop variable
}

for (initialize;
     boolean expr;
     update) {
  do something
}

int i = 0;
while (i < 10) {
  System.out.println (i);
  i++;
}

for (int i = 0; i < 10; ++i) {
  System.out.println (i);
}
Loop variable are not limited to integer, it can be of different data type such as char, double, float, but initialization, Boolean expression and increment must match.

for (int i = 0; i < 10; ++i);
for (float i = 0.0f; i <= 40.0f; i+=5);

Updating variable i (increment)
1. i = i + 1;
2. i++;
3. i+=5;
**PRECEDENCE**

- **Prefix** – increment variable before executing statement
  ```java
  System.out.println(++i);
  ```

- **Postfix** – increment variable after executing statement
  ```java
  System.out.println (i++);
  ```

- **Prefix/Postfix** doesn’t matter if it exist as a single statement.
  ```java
  i++; ++i;
  ```
Arrays

- A container object that can hold multiple elements of the same data type.

**Declaration:**
```
int[] myarray;
String[] wordArray;
```

**Initialization:**
```
myArray = new int[10];
wordArray = {“hello”, “goodbye”, “high”, “low”};
```

**NOTE:** `array_name.length` is a built-in method that returns the length of the array. i.e., `System.out.println(wordArray.length);`
C++ functions

Method heading consists of
1. **Modifier** – public private, protected, … etc.
2. **Return type** – data type or void if no value is returned.
3. **Method name**
4. **Parameter list** – each parameter must include data type separated by commas.
5. **Method body** – all the statements enclosed in curly braces.

```cpp
public void print(String msg) {
    System.out.println (msg);
}

private int sum (int x, int y) {
    return (x + y);
}
```
**NOTE:** Java filename MUST match with the public class name. Otherwise, it will not compile!
COMPILING & RUNNING PROGRAM

C++

To compile:
  g++ helloworld.cpp

To run:
  ./a.out

Java

To compile:
  javac helloworld.java

To run:
  java helloworld