HSBC Technology Graduate Training

Programming Fundamentals: Java

Day 4 (Morning)

Thursday 29 October 2020 | 9am

Contents

+= operator

+= operator

- The **+=** operator performs two operations:
  - Adds the value on the right to the variable on the left.
  - Assigns the new value to the variable on the left.
- The example below shows how **i += 3** is equivalent to **i = i + 3**.

```java
public class Driver {

    public static void main(String args[]) {

      int i = 10;

      i += 3; // equivalent to i = i + 3;

      System.out.println(i); // prints 13.

    }

}
```

++ operator

++ operator

- There are two types of ++ (increment) operators.
  - Post-increment operator.
  - Pre-increment operator.
- The ++ operator is a unary operator (has one operand).
- The operand must be a variable. For instance, the variable i.
  - The post-increment operator on variable i is written i++.
  - The pre-increment operator on variable i is written ++i.

++ operator

- The pre-increment operator ++i performs two steps in the following order:
  - Increments the value stored in variable i by 1.
  - Returns the value of i.

```java
public class Driver {

    public static void main(String args[]) {

      int i = 10;

      System.out.println(++i); // prints 11.

      System.out.println(i); // prints 11.

    }

}
```

++ operator

- The post-increment operator i++ performs two steps in the following order:
  - Returns the value of i.
  - Increments the value stored in variable i by 1.

```java
public class Driver {

    public static void main(String args[]) {

      int i = 10;

      System.out.println(i++); // prints 10.

      System.out.println(i); // prints 11.

    }

}
```

Interfaces

- An abstract class contains one or more abstract members.
- An abstract class may contain non-abstract members.
- An interface is an abstract class that contains <u>only</u> abstract members.

```
1 abstract public class Bank {
2
3     abstract public void openAccount();
4     abstract public void showBalance();
5
6 }
```

```
1 abstract public class Bank {
2
3     abstract public void openAccount();
4     abstract public void showBalance();
5     public void showMessage();
6
7 }
```

- In the example above, we can convert the class on the left to an interface but not the class on the right.

- **The example below shows the conversion from an abstract class to an interface.**

```java
abstract public class Bank {

    abstract public void openAccount();
    abstract public void showBalance();

}
```

```java
interface Bank {

    public void openAccount();
    public void showBalance();

}
```

- **Note that we remove the keyword <u>abstract</u> from the declaration of abstract methods within the interface. This is because all members are abstract in an interface.**

INTERFACES

- A class can <u>extends</u> only 1 class.
- However, a class can <u>implement</u> 0 or more interfaces.

```
public class HSBC implements InvestmentBank, RetailBank, CommercialBank {

}
```

- **Since an interface is a fully abstract class, an implementation of the interface requires us to provide definitions for all its abstract members.**

```java
interface InvestmentBank {

    public void doInvestmentBanking();

}
```

```java
interface CommercialBank {

    public void doCommercialBanking();

}
```

```java
interface RetailBank {

    public void doRetailBanking();

}
```

```java
public class HSBC implements InvestmentBank, RetailBank, CommercialBank {

  public void doInvestmentBanking() {
    System.out.println("Doing investment banking.");
  }

  public void doCommercialBanking() {
    System.out.println("Doing commercial banking.");
  }

  public void doRetailBanking() {
    System.out.println("Doing retail banking.");
  }

}
```

Logical Operators

LOGICAL OPERATORS

- Logical operators are also known as Boolean operators.
- Logical operators operate on Boolean values.
- Boolean values can only have one of two states: true and false.
- Just like we can do operations on numeric values, we can do operations on Boolean values.
- Some common Boolean operators are AND, OR, NOT.
  - NOT: is a unary Boolean operator.
  - AND, OR: are binary Boolean operators.
- The tables below show the behaviors of these operators.

A	B	A OR B
False	False	False
False	True	True
True	False	True
True	True	True

A	B	A AND B
False	False	False
False	True	False
True	False	False
True	True	True

A	NOT A
False	True
True	False

LOGICAL OPERATORS

- In Java, the logical operators are represented in the following way:
  - AND: &&
  - OR: ||
  - NOT: !

```java
public class Driver {

    public static void main(String args[]) {

      // AND
      System.out.println(false && false); // false
      System.out.println(true && false); // false
      System.out.println(false && true); // false
      System.out.println(true && true); // true

      // OR
      System.out.println(false || false); // false
      System.out.println(true || false); // false
      System.out.println(false || true); // false
      System.out.println(true || true); // true

      // NOT
      System.out.println(!true); // false
      System.out.println(!false); // true

    }

}
```

Networks

NETWORKS

- A computer network is where at least 2 devices are connected to each other.
- Why do we need computer networks? To share resources.
- Resources are expensive.
- For instance, all devices within an office are connected to a local network.
- The local network is connected to the internet.
- It would be impractical to connect every device directly to the internet.

HTML

HTML

- HTML – Hyper Text Markup Language
- A language used to represent webpages.
- Tells the browser the structure, content, layout of a webpage.
- HTML files contain tags.
- Tags are represented by angle brackets. Here are some example of tags:
  - : paragraph tag
  - <h1> : header 1 tag
  - : unordered list tag
- There are opening and closing tags to represent the start and end of a tag area.
  - Closing tags have a slash within in. e.g. , </h1>,
- For instance <h1>Hello World</h1>
  - This presents Hello World as a header with the word ‘World’ in bold.

HTML

- We can create a HTML using a simple text editor.
- We open the HTML with a browser such as Google Chrome.

```html
<html>
  <h1>Hello, world!</h1>
</html>
```

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