



NUML

National University of Modern Languages

OOP

BS-Software Engineering 2nd-E

LAB #1

Hamza Mehmood

Roll# SP-21-110

NUML-S21-23529

Title: Lab Report 1

Submitted to
Mam. Sadaf

National University of Modern Languages

Object Oriented Programming

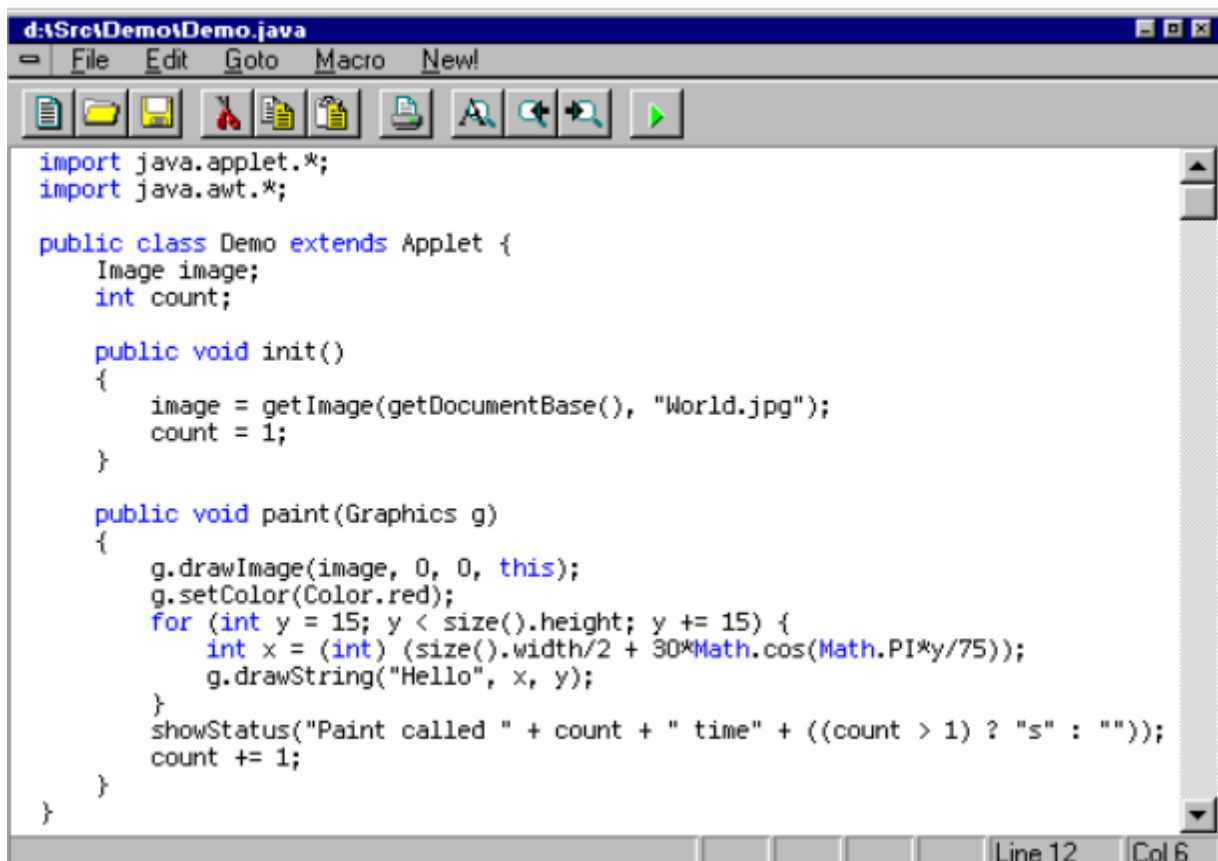
Week 1 (27-9-2021)

Table of Contents

S.no.	Programs
1	What is A Program?
2	Getting Started
3	Simple Java Application
4	First Program in Java
5	Simple Arithmetic Short Hand Increment & Decrement
6	Relational Operators Logical Operators

What is A Program?

A **computer program** (also a software program, or just a program) is a sequence of instructions written to perform a specified task for a computer.



```
d:\Src\Demo\Demo.java
File Edit Goto Macro New!
import java.applet.*;
import java.awt.*;

public class Demo extends Applet {
    Image image;
    int count;

    public void init()
    {
        image = getImage(getDocumentBase(), "World.jpg");
        count = 1;
    }

    public void paint(Graphics g)
    {
        g.drawImage(image, 0, 0, this);
        g.setColor(Color.red);
        for (int y = 15; y < size().height; y += 15) {
            int x = (int) (size().width/2 + 30*Math.cos(Math.PI*y/75));
            g.drawString("Hello", x, y);
        }
        showStatus("Paint called " + count + " time" + ((count > 1) ? "s" : ""));
        count += 1;
    }
}
```

Line 12 Col 6

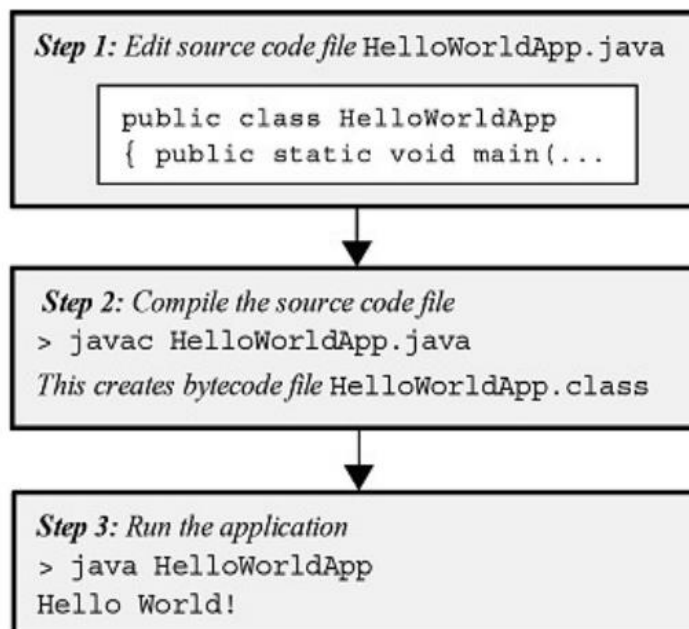
Getting Started

To begin developing Java programs, follow these steps:

Step 1: Obtain the Software Development Kit (SDK) for J2SE (Java 2 Platform, Standard Edition) or JDK

Step 2: Install the JDK

Simple Java Application



- ▶ **Step 1:** Use an **editor** to enter the following code for the HelloWorldApp program:

HelloWorldApp Application

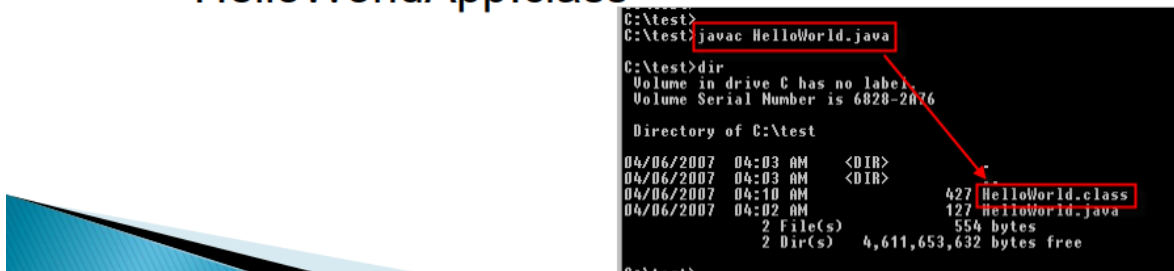
- ▶ Save this code in a file called **HelloWorldApp.java**

-
- ▶ **Step 2:** **Compile** the application with the command line:

> javac HelloWorldApp.java

- ▶ This creates the **class file** (with the bytecode output):

HelloWorldApp.class



-
- ▶ **Step 3:** Use the **java** command to run the program:

> java HelloWorldApp

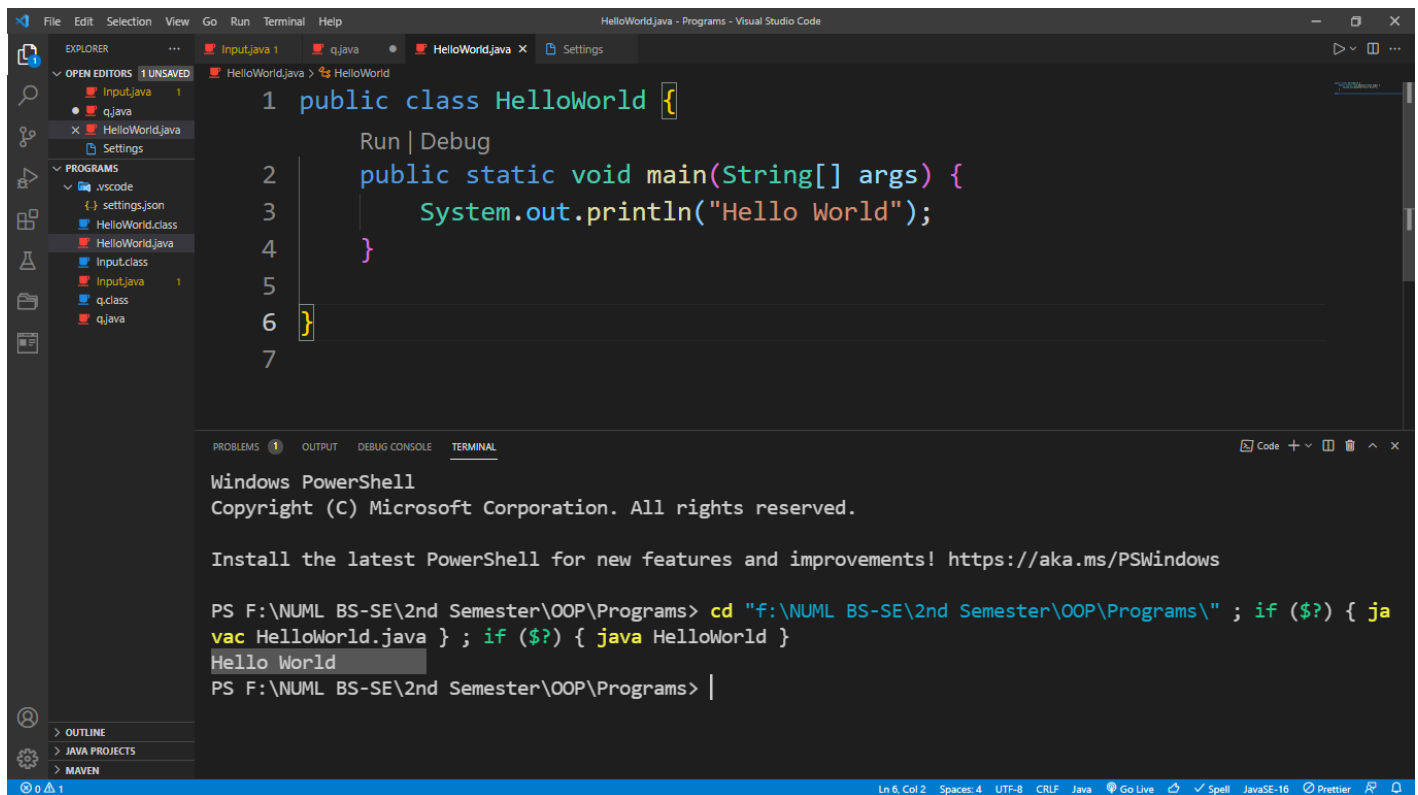
Output
Hello World!

- ▶ The output is printed after the command line.
-

First Program in Java

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

OOP LAB REPORT 1



The screenshot shows the Visual Studio Code interface. The Explorer panel on the left shows a project named 'HelloWorld' with files 'Input.java', 'q.java', and 'HelloWorld.java'. The main editor displays the code for 'HelloWorld.java':

```
1 public class HelloWorld {  
    Run | Debug  
2     public static void main(String[] args) {  
3         System.out.println("Hello World");  
4     }  
5  
6 }  
7
```

The bottom panel shows the 'TERMINAL' output:

```
Windows PowerShell  
Copyright (C) Microsoft Corporation. All rights reserved.  
  
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows  
  
PS F:\NUML BS-SE\2nd Semester\OOP\Programs> cd "f:\NUML BS-SE\2nd Semester\OOP\Programs\" ; if ($?) { javac HelloWorld.java } ; if ($?) { java HelloWorld }  
Hello World  
PS F:\NUML BS-SE\2nd Semester\OOP\Programs> |
```

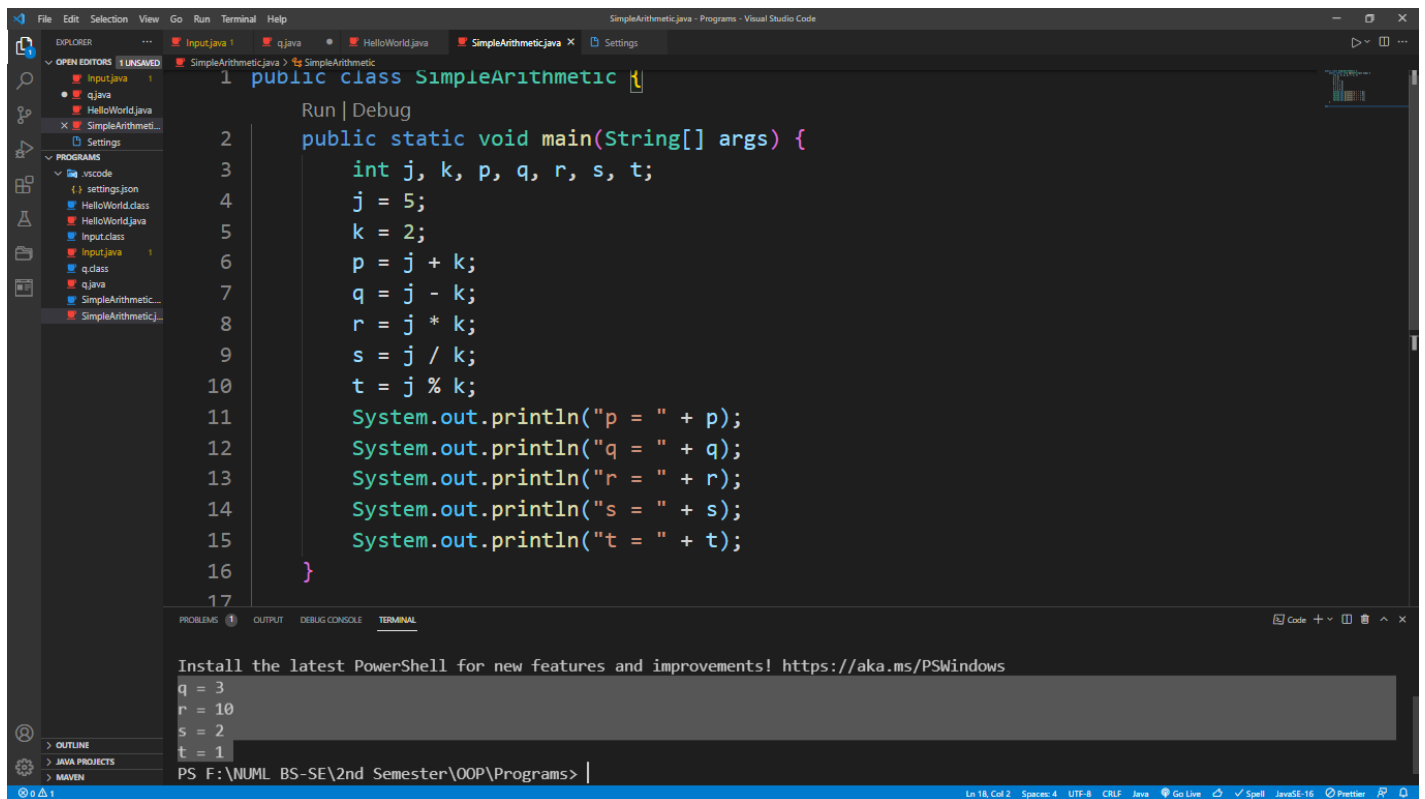
Simple Arithmetic in Java

```
public class SimpleArithmetic {  
    public static void main(String[] args) {  
        int j, k, p, q, r, s, t;  
        j = 5;  
        k = 2;  
        p = j + k;  
        q = j - k;
```

OOP LAB REPORT 1

```
    r = j * k;  
    s = j / k;  
    t = j % k;  
  
    System.out.println("p = " + p);  
    System.out.println("q = " + q);  
    System.out.println("r = " + r);  
    System.out.println("s = " + s);  
    System.out.println("t = " + t);  
}  
  
}
```


OOP LAB REPORT 1



```
1 public class SimpleArithmetic {
2     public static void main(String[] args) {
3         int j, k, p, q, r, s, t;
4         j = 5;
5         k = 2;
6         p = j + k;
7         q = j - k;
8         r = j * k;
9         s = j / k;
10        t = j % k;
11        System.out.println("p = " + p);
12        System.out.println("q = " + q);
13        System.out.println("r = " + r);
14        System.out.println("s = " + s);
15        System.out.println("t = " + t);
16    }
17 }
```

Install the latest PowerShell for new features and improvements! <https://aka.ms/PSWindows>

q = 3
r = 10
s = 2
t = 1

PS F:\NUML BS-SE\2nd Semester\OOP\Programs> |

Short Hand Operator

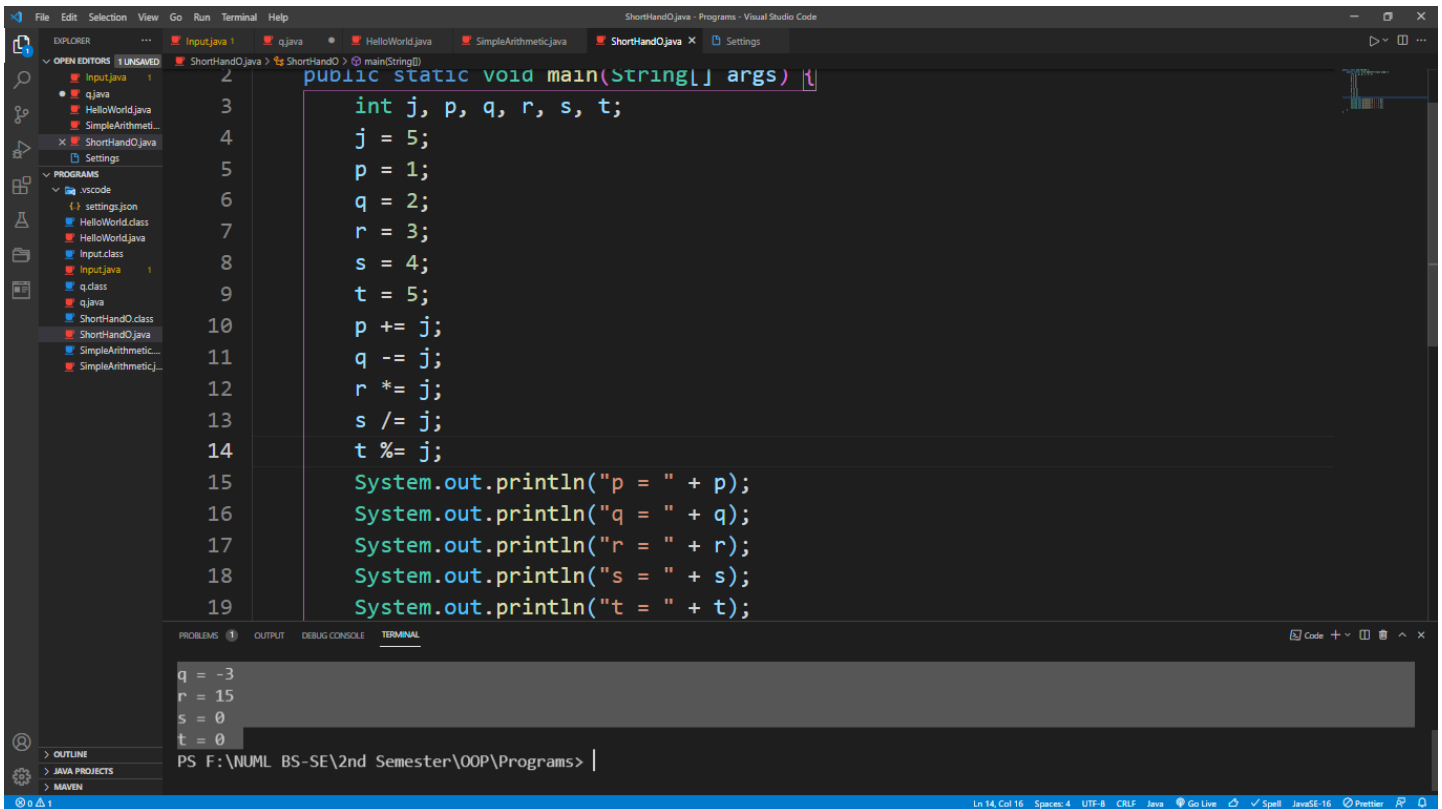
```
public class ShortHand0 {
    public static void main(String[] args)
    {
        int j, p, q, r, s, t;
        j = 5;
        p = 1;
        q = 2;
        r = 3;
```

OOP LAB REPORT 1

```
s = 4;
t = 5;
p += j;
q -= j;
r *= j;
s /= j;
t %= j;

System.out.println("p = " + p);
System.out.println("q = " + q);
System.out.println("r = " + r);
System.out.println("s = " + s);
System.out.println("t = " + t);
}
}
```

OOP LAB REPORT 1



The screenshot shows a Visual Studio Code editor with a Java file named `ShortHandO.java`. The code defines a `main` method that initializes variables `j, p, q, r, s, t` and performs a series of arithmetic operations. The terminal output shows the values of `q, r, s, t` after the operations.

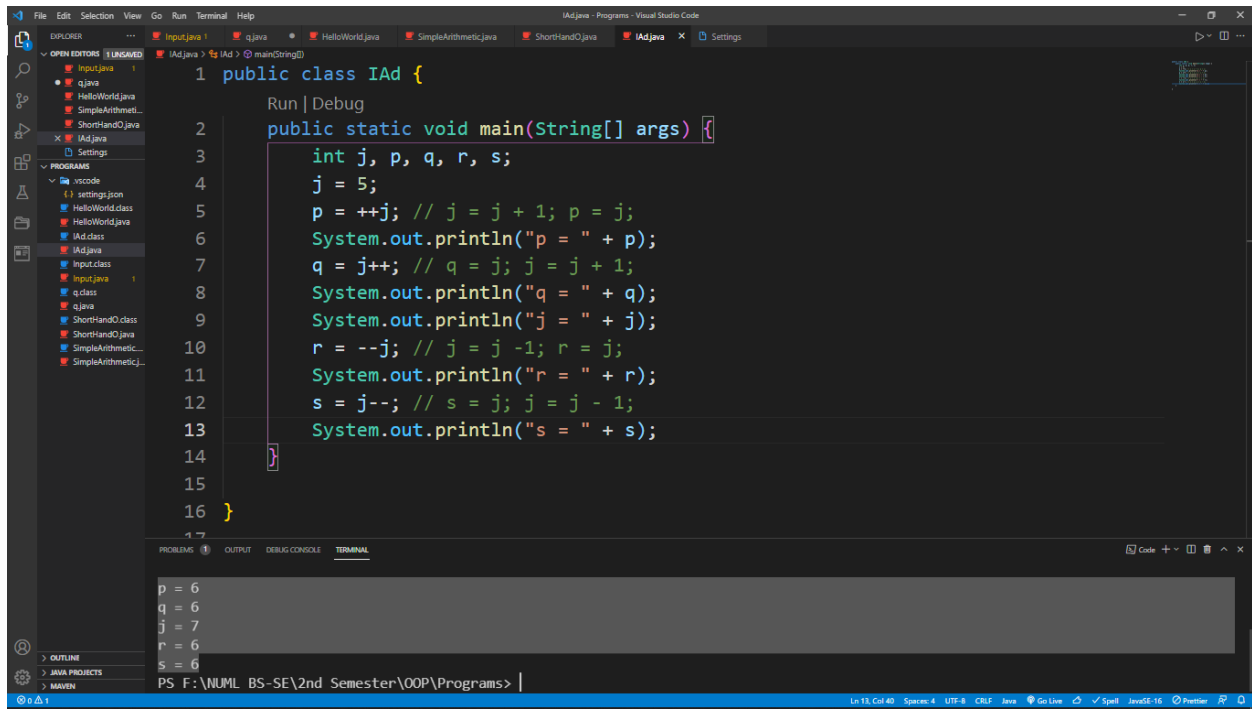
```
public static void main(String[] args) {  
    int j, p, q, r, s, t;  
    j = 5;  
    p = 1;  
    q = 2;  
    r = 3;  
    s = 4;  
    t = 5;  
    p += j;  
    q -= j;  
    r *= j;  
    s /= j;  
    t %= j;  
    System.out.println("p = " + p);  
    System.out.println("q = " + q);  
    System.out.println("r = " + r);  
    System.out.println("s = " + s);  
    System.out.println("t = " + t);  
}
```

Terminal Output:

```
q = -3  
r = 15  
s = 0  
t = 0
```

PS F:\NUML BS-SE\2nd Semester\OOP\Programs>

Increment & Decrement



The screenshot shows a Visual Studio Code editor with a Java file named `IAD.java`. The code defines a `main` method that initializes variables `j, p, q, r, s` and performs a series of increment and decrement operations. The terminal output shows the values of `p, q, j, r, s` after the operations.

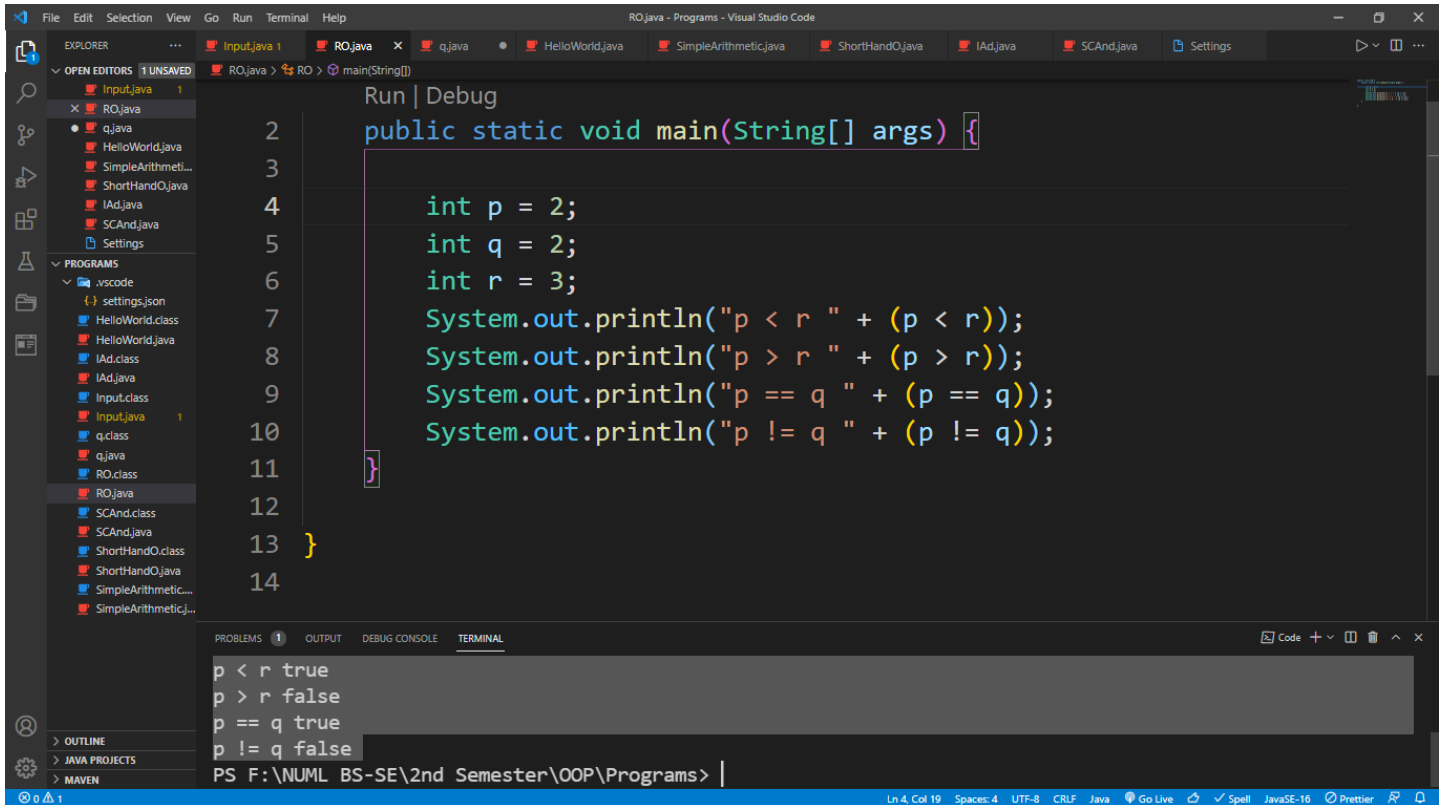
```
public class IAD {  
    public static void main(String[] args) {  
        int j, p, q, r, s;  
        j = 5;  
        p = ++j; // j = j + 1; p = j;  
        System.out.println("p = " + p);  
        q = j++; // q = j; j = j + 1;  
        System.out.println("q = " + q);  
        System.out.println("j = " + j);  
        r = --j; // j = j - 1; r = j;  
        System.out.println("r = " + r);  
        s = j--; // s = j; j = j - 1;  
        System.out.println("s = " + s);  
    }  
}
```

Terminal Output:

```
p = 6  
q = 6  
j = 7  
r = 6  
s = 6
```

PS F:\NUML BS-SE\2nd Semester\OOP\Programs>

Relational Operators



```
File Edit Selection View Go Run Terminal Help
RO.java - Programs - Visual Studio Code

EXPLORER
  OPEN EDITORS 1 UNSAVED
    Input.java 1
    RO.java
    q.java
    HelloWorld.java
    SimpleArithmeti...
    ShortHandO.java
    IAd.java
    SCAnd.java
    Settings
  PROGRAMS
    .vscode
    settings.json
    HelloWorld.class
    HelloWorld.java
    IAd.class
    IAd.java
    Input.class
    Input.java 1
    q.class
    q.java
    RO.class
    RO.java
    SCAnd.class
    SCAnd.java
    ShortHandO.class
    ShortHandO.java
    SimpleArithmeti...
    SimpleArithmeti...

2 public static void main(String[] args) {
3
4     int p = 2;
5     int q = 2;
6     int r = 3;
7     System.out.println("p < r " + (p < r));
8     System.out.println("p > r " + (p > r));
9     System.out.println("p == q " + (p == q));
10    System.out.println("p != q " + (p != q));
11
12 }
13
14

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL
p < r true
p > r false
p == q true
p != q false
PS F:\NUML BS-SE\2nd Semester\OOP\Programs> |
```

Logical Operators

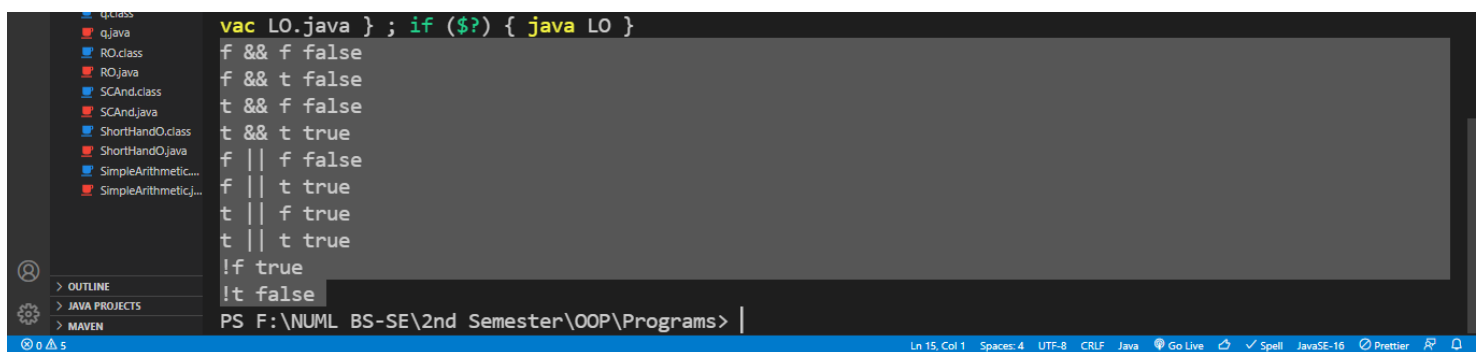
```
public class LO {
    public static void main(String[] args) {
        boolean t = true;
        boolean f = false;
        System.out.println("f && f " + (f && f));
    }
}
```

OOP LAB REPORT 1

```
System.out.println("f && t " + (f && t));
System.out.println("t && f " + (t && f));
System.out.println("t && t " + (t && t));
System.out.println("f || f " + (f || f));
System.out.println("f || t " + (f || t));
System.out.println("t || f " + (t || f));
System.out.println("t || t " + (t || t));
System.out.println("!f " + !f);
System.out.println("!t " + !t);

}

}
```



The screenshot shows an IDE with a project explorer on the left containing files like q.class, q.java, RO.class, RO.java, SCAnd.class, SCAnd.java, ShortHandO.class, ShortHandO.java, SimpleArithmetic..., and SimpleArithmeticj.... The main editor displays the following Java code:

```
vac LO.java } ; if ($?) { java LO }
f && f false
f && t false
t && f false
t && t true
f || f false
f || t true
t || f true
t || t true
!f true
!t false
```

The status bar at the bottom indicates the file path is PS F:\NUML BS-SE\2nd Semester\OOP\Programs> and shows various tool icons like Go Live, Spell, JavaSE-16, and Prettier.

Logical BIT Operators

```
public class LBOperator {  
    public static void main(String[] args)  
    {  
        int a = 10; // 00001010 = 10  
        int b = 12; // 00001100 = 12  
        int and, or, xor, na;  
        and = a & b; // 00001000 = 8  
        or = a | b; // 00001110 = 14  
        xor = a ^ b; // 00000110 = 6  
        na = ~a; // 11110101 = -11  
        System.out.println("and " + and);  
        System.out.println("or " + or);  
        System.out.println("xor " + xor);  
        System.out.println("na " + na);  
    }  
}
```

OOP LAB REPORT 1

```
PS F:\NUML BS-SE\2nd Semester\OOP\Programs> cd "f:\NUML BS-SE\2nd Semester\OOP\Programs\" ; if ($?) { java
vac LBO.JAVA } ; if ($?) { java LBO }
error: Class names, 'LBO.JAVA', are only accepted if annotation processing is explicitly requested
1 error
PS F:\NUML BS-SE\2nd Semester\OOP\Programs> cd "f:\NUML BS-SE\2nd Semester\OOP\Programs\" ; if ($?) { java
vac LBOoperator.java } ; if ($?) { java LBOoperator }
and 8
or 14
xor 6
na -11
PS F:\NUML BS-SE\2nd Semester\OOP\Programs> |
```

