CDAC MUMBAI

OOPJ

Assignment-1

1. **Create a program that declares and initializes all primitive data types in Java and prints their default and assigned values.**

```
public class PrimitiveDataTypes {
   public static void main(String[] args) {
      byte b = 10;
      short s = 20;
      int i = 100;
      long l = 100000L;
      float f = 10.5f;
      double d = 99.99;
      char c = 'A';
      boolean bool = true;

      System.out.println("Byte: " + b);
      System.out.println("Short: " + s);
      System.out.println("Int: " + i);
      System.out.println("Long: " + l);
      System.out.println("Float: " + f);
      System.out.println("Double: " + d);
      System.out.println("Char: " + c);
      System.out.println("Boolean: " + bool);
   }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac PrimitiveDataTypes.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java PrimitiveDataTypes
Byte: 10
Short: 20
Int: 100
Long: 100000
Float: 10.5
Double: 99.99
Char: A
Boolean: true
```

2. **Write a program to convert an int value to double automatically and display both values.**

```
public class IntToDouble {
   public static void main(String[] args) {
      int num = 42;
      double dnum = num;

      System.out.println("Integer Value: " + num);
      System.out.println("Converted Double Value: " + dnum);
   }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac IntToDouble.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java IntToDouble
Integer Value: 42
Converted Double Value: 42.0
```

3. **Write a program to convert a double value to int using typecasting and explain the data loss.**

```
public class DoubleToInt {
   public static void main(String[] args) {
      double dnum = 99.99;
      int inum = (int) dnum;

      System.out.println("Double Value: " + dnum);
      System.out.println("Converted Integer Value: " + inum);
   }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac DoubleToInt.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java DoubleToInt
Double Value: 99.99
Converted Integer Value: 99
```

4. **Write a program to calculate the average of three int numbers using typecasting to display the result in double.**

```
public class AverageCalculator {
   public static void main(String[] args) {
      int a = 10, b = 20, c = 30;
      double avg = (a + b + c) / 3.0;
```

```
        System.out.println("Average: " + avg);
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac AverageCalculator.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java AverageCalculator
Average: 20.0
```

5. **Write a program to demonstrate binary, octal, hexadecimal, and floating-point literals in Java.**

```
public class LiteralsDemo {
    public static void main(String[] args) {
        int binary = 0b1010;
        int octal = 012;
        int hex = 0xA;
        float floatNum = 3.14f;
        double doubleNum = 2.71828;

        System.out.println("Binary: " + binary);
        System.out.println("Octal: " + octal);
        System.out.println("Hexadecimal: " + hex);
        System.out.println("Float: " + floatNum);
        System.out.println("Double: " + doubleNum);
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac LiteralsDemo.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java LiteralsDemo
Binary: 10
Octal: 10
Hexadecimal: 10
Float: 3.14
Double: 2.71828
```

6. **Write a program to display character and string literals along with their ASCII values.**

```
public class CharAndStringLiterals {
    public static void main(String[] args) {
        char ch = 'A';
        String str = "Hello, Java!";

        System.out.println("Character: " + ch + " ASCII: " + (int) ch);
```

```
        for (char c : str.toCharArray()) {
            System.out.println("Char: " + c + " ASCII: " + (int) c);
        }
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac CharAndStringLiterals.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java CharAndStringLiterals
Character: A ASCII: 65
Char: H ASCII: 72
Char: e ASCII: 101
Char: l ASCII: 108
Char: l ASCII: 108
Char: o ASCII: 111
Char: , ASCII: 44
Char:   ASCII: 32
Char: J ASCII: 74
Char: a ASCII: 97
Char: v ASCII: 118
Char: a ASCII: 97
Char: ! ASCII: 33
```

7. Write a program that uses boolean literals to control program flow in an if-else statement.

```
public class BooleanFlow {
    public static void main(String[] args) {
        boolean condition = true;

        if (condition) {
            System.out.println("Condition is TRUE!");
        } else {
            System.out.println("Condition is FALSE!");
        }
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac BooleanFlow.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java BooleanFlow
Condition is TRUE!
```

8. Write a program to perform addition, subtraction, multiplication, division, and modulus operations on two integer numbers and display the results.

```
public class ArithmeticOperations {
    public static void main(String[] args) {
```

```
        int a = 20, b = 10;

        System.out.println("Addition: " + (a + b));
        System.out.println("Subtraction: " + (a - b));
        System.out.println("Multiplication: " + (a * b));
        System.out.println("Division: " + (a / b));
        System.out.println("Modulus: " + (a % b));
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>java ArithmeticOperations
Addition: 30
Subtraction: 10
Multiplication: 200
Division: 2
Modulus: 0
```

9. Write a program to perform addition, subtraction, multiplication, division, and modulus operations on two integer numbers and display the results.

- Same as above.

10. Write a program to compare two integers using all relational operators (==, !=, >, <, >=, <=) and display the results.

```
public class RelationalOperators {
    public static void main(String[] args) {
        int x = 15, y = 10;

        System.out.println("x == y: " + (x == y));
        System.out.println("x != y: " + (x != y));
        System.out.println("x > y: " + (x > y));
        System.out.println("x < y: " + (x < y));
        System.out.println("x >= y: " + (x >= y));
        System.out.println("x <= y: " + (x <= y));
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac RelationalOperators.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java RelationalOperators
x == y: false
x != y: true
x > y: true
x < y: false
x >= y: true
x <= y: false
```

11. Write a program to check if a number is positive and even using logical operators (&&, ||, !).

```
import java.util.Scanner;

public class LogicalOperators {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int num = sc.nextInt();

      if (num > 0 && num % 2 == 0) {
         System.out.println(num + " is positive and even.");
      } else if (num > 0 && num % 2 != 0) {
         System.out.println(num + " is positive but not even.");
      } else {
         System.out.println(num + " is not positive.");
      }

      sc.close();
   }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac LogicalOperators.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java LogicalOperators
Enter a number: 25
25 is positive but not even.
```

12. Write a program to demonstrate the use of assignment operators (=, +=, -=, *=, /=, %=) on two integers.

```
public class AssignmentOperators {
```

```
    public static void main(String[] args) {
        int a = 10, b = 5;

        a += b; // a = a + b
        System.out.println("After += : " + a);

        a -= b; // a = a - b
        System.out.println("After -= : " + a);

        a *= b; // a = a * b
        System.out.println("After *= : " + a);

        a /= b; // a = a / b
        System.out.println("After /= : " + a);

        a %= b; // a = a % b
        System.out.println("After %= : " + a);
    }
}
```

```
C:\Users\abhiv\Desktop\CDACKH\OOPJ>javac AssignmentOperators.java

C:\Users\abhiv\Desktop\CDACKH\OOPJ>java AssignmentOperators
After += : 15
After -= : 10
After *= : 50
After /= : 10
After %= : 0
```