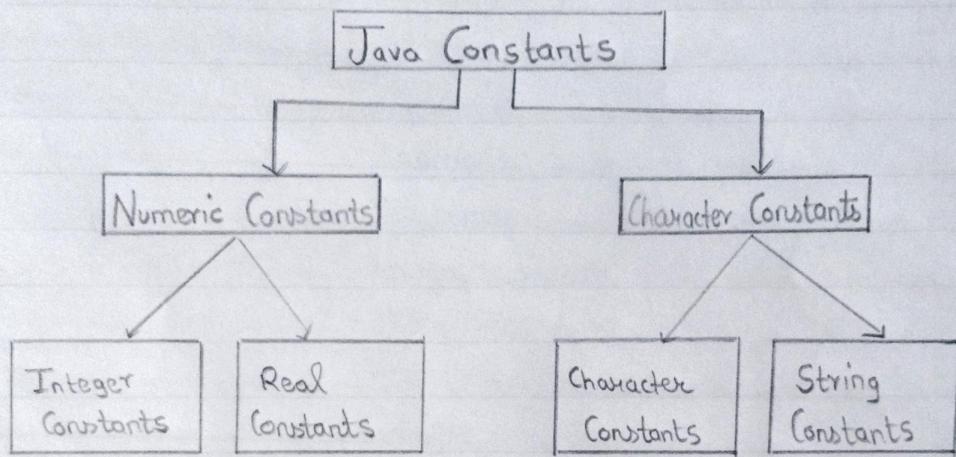


# Practical No. 01

Aim: Create, debug and run java programs based on constants, variables and operators.

Theory:



Java Constants

Concepts:

of constants, variables and operators in Java

## Practical No. 01

Aim: Create, debug and run java programs based on constants, variables and operators.

### Theory:

#### i) Constants:

- Constants in Java refer to fixed values that do not change during execution of programme.
- Constants in Java are divided into two sub-types, numeric constants and character constants.
- The numeric constants are further divided into integer constants and real constants.
- The character constants are further divided into character constants and string constants.

#### • Examples,

##### numeric constants :

i) Integer constants - 123, -321

ii) Real constants - 0.083, -0.15, 0.65E4

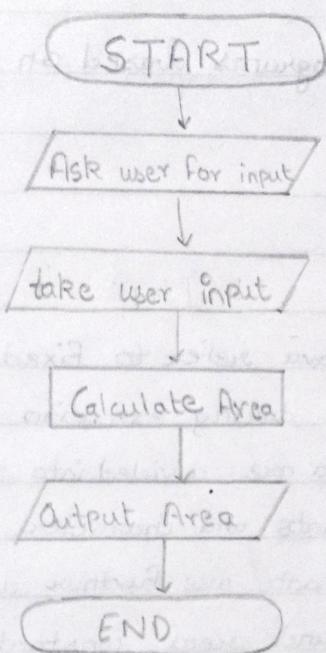
##### character constants :

i) character constants - 'x', '5', 'A'

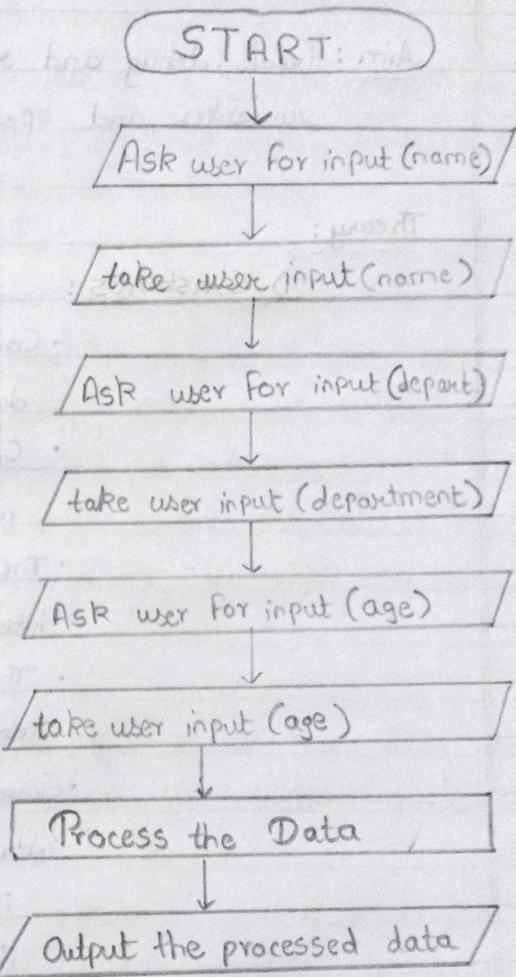
ii) String constants - "Hello", "1997", "?\$.."

#### 2) Variables :

- A variable is an identifier that denotes a storage location used to store a data value.
- Unlike constants that remain unchanged during the execution of a program, a variable may take different values at different times during the



Code 1 flow chart:  
Constants



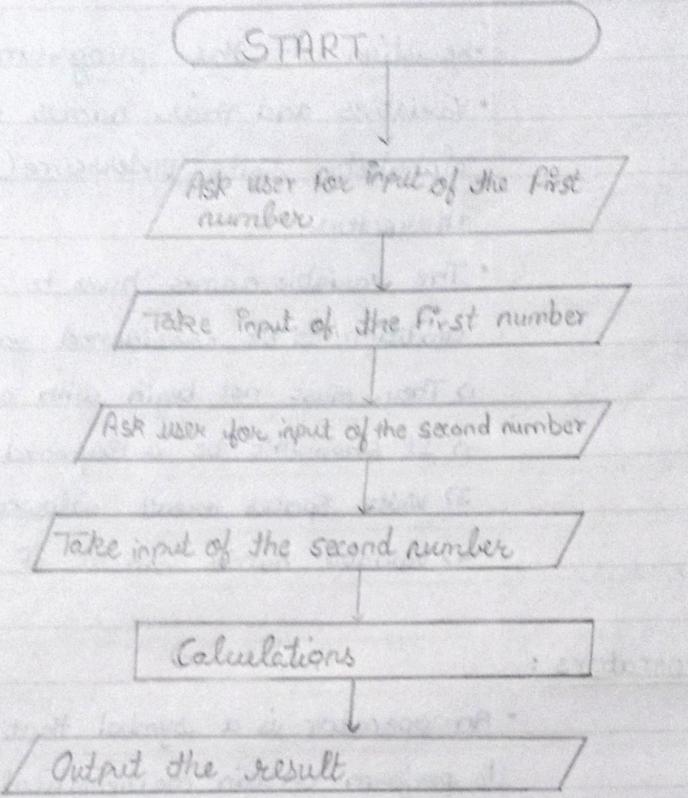
Code 2 flow chart: Operator

execution of the program.

- Variables and their names may consist of alphabets, digits, underscore (-), and dollar (\$) characters.
- The variable names have to meet the below condition to be considered valid.
  - 1) They must not begin with a digit.
  - 2) It shouldn't be a keyword.
  - 3) White spaces aren't allowed.
  - 4) Variable names can be of any length.

### 3) Operators :

- An operator is a symbol that tells the computer to perform certain mathematical or logical manipulations.
- The java operators can be specified into a number of related categories as below.
  - 1) Arithmetic operators , e.g. +, -, /, \*, %.
  - 2) Relational operators , e.g. <, >, ==, !=
  - 3) Logical operators , e.g. &&, ||, !
  - 4) Assignment operators , e.g. =
  - 5) Increment / Decrement operators . ++, --
  - 6) Conditional operators , ( ? ? )
  - 7) Bitwise operators , &, !, ^, ~, <<, >>, >>
  - 8) Special operators



### Code & flow chart : Operators

#### Conclusion :

Hence, by performing this practical, I learnt about the concepts of constants, variables and operators in Java. I also created, debugged and executed three Java programs on the concepts of constants, variables and operators respectively.

### Code 1 : Constants

```
import java.util.Scanner;

class PracticalOneA {
    public static void main(String[] args) {
        final double PI = 3.14;
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter Radius of Circle : ");
        float radius = sc.nextFloat();
        System.out.println("Area of circle : " + (PI * radius * radius) );

        System.out.print("Enter length and breadth of Rectangle : ");
        float length = sc.nextFloat();
        float breadth = sc.nextFloat();
        System.out.println("Area of Rectangle : " + (length * breadth) );

        System.out.print("Enter Side of Square : ");
        float side = sc.nextFloat();
        System.out.println("Area of Square : " + (side * side) );
    }
}
```

### Output :

```
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical One\codes>javac PracticalOneA.java
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical One\codes>java PracticalOneA
Enter Radius of Circle : 10
Area of circle : 314.0
Enter length and breadth of Rectangle : 10 20
Area of Rectangle : 200.0
Enter Side of Square : 15
Area of Square : 225.0
```

## Code 2 : Variables

```
import java.util.Scanner;

class PracticalOneB {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        var name = " ";
        var age = 0;
        var department = " ";

        System.out.print("Enter your full name : ");
        name = sc.nextLine();
        System.out.print("Enter your Department : ");
        department = sc.nextLine();
        System.out.print("Enter your age : ");
        age = sc.nextInt();

        System.out.println("Name : " + name );
        System.out.println("Department : " + department );
        System.out.println("Age : " + age );

    }
}
```

Output :

```
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical One\codes>java PracticalOneB
Enter your full name : Pratyay Prasad Dhond
Enter your Department : Information Technology
Enter your age : 18
Name : Pratyay Prasad Dhond
Department : Information Technology
Age : 18
```

### Code 3 : Operators

```
import java.util.Scanner;

class PracticalOneC {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int a;
        int b;

        System.out.print("Enter First Number : ");
        a = sc.nextInt();
        System.out.print("Enter Second Number : ");
        b = sc.nextInt();

        System.out.println(a + " + " + b + " = " + (a + b));
        System.out.println(a + " - " + b + " = " + (a - b));
        System.out.println(a + " * " + b + " = " + (a * b));
        System.out.println(a + " / " + b + " = " + (a / b));
        System.out.println(a + " % " + b + " = " + (a % b));

    }
}
```

Output :

```
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical One\codes>java PracticalOneC
Enter First Number : 18
Enter Second Number : 5
18 + 5 = 23
18 - 5 = 13
18 * 5 = 90
18 / 5 = 3
18 % 5 = 3
```

Conclusion :

Hence, by performing this practical, I learnt about the concepts of constants, variables and operators in Java. I also created, debugged and executed three Java programs on the concepts of constants, variables and operators respectively.