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Experiment No: 01

Aim:- To write some simple programs in Java such as:
i) To find factorial of number.
ii) To display first 50 prime numbers.
iii) To find sum and average of N numbers

Software Used –Eclipse

Theory:Control Structures:

1.Java's Selection Statements
2.Java's Iteration Statements
3.Java's Jump Statements

Control statements are the statements which alter the flow of execution and provide better control to the programmer on the flow of execution. In Java control statements are categorized into selection control statements, iteration control statements ,jump control statements.

1.Java's Selection Statements:

In java, selection statements are also known as branching statements or conditional or decision-making statements. It is used to select part of a program to be executed based on condition.

1. If statement
2. Switch statement

If Statement:

It is used to control the flow of the execution of statements. The if statement may be implemented in different forms depending on the complexity of conditions to be tested:
Simple if statement
If_else statement
Nested if…..else statement
Else if Ladder

Simple if statement :

This is called as a statement as it only checks the condition once.
Syntax:

```
if(condition)
{ //
statement;
 //statement2 . .
 statement n
```

if_else statement:-

If statement performs a task depending on whether a condition is true or false.

Syntax:

```
if (condition)
{ //true statements
 }
else
 { //
false statements
}
```

Switch :

When there are several options and we have to choose only one option from the available ones, we can use switch statement.

Syntax:

```
switch (expression)
{
case value1:
 //statement sequence
break; case value2:
//statement sequence
break;..... case valueN:
 //statement sequence break;
default: //
default statement sequence
}
```

2.Java's Iteration Statements

The java programming language provides a set of iterative statements that are used to execute a statement or a block of statements repeatedly as long as the given condition is true. The iterative statements are also known as looping statements or repetitive statements. Java provides the following iterative statements.

while statement
do-while statement
for statement
for-each statement

3. Java's Jump Statements

Jumping statements are control statements that transfer execution control from one point to another point in the program. There are two Jump statements that are provided in the Java programming language:

Break statement.

Continue statement.

Program Code:

Attach printout of program along with output.

Conclusion:

Questions-

1) **What are features of Java?**
2) **What is bytecode?**
3) **What is difference between JDK, JVM and JRE?**
4) **Give classification of data types used in Java?**

Experiment No: 02

Aim:- To write a program in Java to implement a Calculator with simple arithmeticoperations such as add, subtract, multiply, divide, factorial etc.

Software Used- Eclipse IDE

Theory:
Operator in Java is a symbol that is used to perform operations. For example: +, -, *, / etc.
There are many types of operators in Java which are given below:
Unary Operator
Arithmetic Operator
Shift Operator
Relational Operator
Bitwise Operator
Logical Operator
Ternary Operator
Assignment Operator.

Arithmetic operators:

These operators are used to perform fundamental operations like addition, subtraction, multiplication etc.Java provides a rich operator environment like Arithmetic, Relational,Bitwise, and Logical. Java arithmetic operators are used to perform simple mathematical operations. In Java, we consider Addition, Subtraction, Multiplication and Division operators as Basic Arithmetic operators. For arithmetic operators, operands should of Numeric Type. Java allows to use of arithmetic operations on char type; in java, char is considered a subset of int. Some binary arithmetic operators are also used as unary operators;
for example, the subtraction operator is also used for negating the positive value. If anyone of the operand types is double, float, long. The other operand is also converted to double, float, long, respectively.

List of Arithmetic Operators in Java

The following table shows the list of all arithmetic operators in java.

Operator	Description
+	Addition (Also used as Unary Plus).
–	Subtraction (Also used as Unary Minus).
*	Multiplication
/	Division
%	Modulus
++	Increment
—	Decrement

Program code:

Add program print out along with output

Conclusion:

Questions-

1) What are different types of variables? Explain it with an example.
2) Operators with higher precedence are evaluated before operators with relatively lower precedence. Arrange the operators given below in order of higher precedence to lower precedence.
   (i) && (ii) % (iii) >= (iv) ++

3) Write output of following program

```
public class Main{
  public static void main(String args[])
{
      int x = 2, y = 3, z = 4;

      int ans = ++x + ++y + 5 << 1 | 2;

      System.out.println(ans);
  }
}
```