

St. Francis Institute of Technology, Mumbai-400 103
Department Of Information Technology

A.Y. 2020-2021
Class: SE-ITA/B, Semester: III

Subject: **Java Programming Lab**

Experiment-1: Java Program to implement principles of OOP using Control and Looping Statements.

1. Aim: Write a Java program to demonstrate the following:

a. Write a menu driven Java program which will read a number and should implement the following methods :

- i. Factorial()
- ii. Reverse of a Number()
- iii. Test Armstrong()
- iv. Test Palindrome()
- v. Test Prime()
- vi. Fibonacci Series()

b. Implement a java program to calculate gross salary & net salary taking the following data.

Input: empno, empname, basic

Process: DA=70% of basic, HRA=30% of basic, CCA=Rs240/-, PF=10% of basic,

PT= Rs100/-

2. Prerequisite: Knowledge of basics of OOP and Data Types.

3. Requirements: Personal Computer (PC), Windows Operating System, Net beans 8.0.

4. Pre-Experiment Exercise:

Theory:

a) Datatypes:

Type	Description	Default	Size	Example Literals
boolean	true or false	false	1 bit	true, false

byte	twos complement integer	0	8 bits	(none)
char	Unicode character	\u0000	16 bits	'a', '\u0041', '\101', '\\', '\"', '\n', '\b'
short	twos complement integer	0	16 bits	(none)
int	twos complement integer	0	32 bits	-2, -1, 0, 1, 2
long	twos complement integer	0	64 bits	-2L, -1L, 0L, 1L, 2L
float	IEEE 754 floating point	0.0	32 bits	1.23e100f, -1.23e-100f, .3f, 3.14F
double	IEEE 754 floating point	0.0	64 bits	1.23456e300d, -1.23456e-300d, 1e1d

b) **If...else statement:** It checks Boolean condition: *true* or *false*. There are various types of if statement in java.

- i. if statement
- ii. if-else statement
- iii. if-else-if ladder
- iv. nested if statement

- c) **Switch statement:** The Java *switch statement* executes one statement from multiple conditions. It is like if-else-if ladder statement.
- d) **Looping statements:** loops are used to execute a set of instructions/functions repeatedly when some conditions become true. There are three types of loops in java.
 - i. for loop
 - ii. while loop
 - iii. do-while loop
 - iv. for each loop

5. Laboratory Exercise

A. Procedure

- i. Open Net beans for Java.
- ii. Open File and Create New Java Project.
- iii. Inside the Java Project rename give name to your Java Class.
- iv. Click on Finish.
- v. Type the Java Code in the opened class.
- vi. Save the code by pressing Ctrl+S.
- vii. Run the code by pressing Shift+F6.

B. Program code with comments:

Write and execute your program code to achieve the given aim and attach it **with your own comments with neat indentation.**

6. Post-Experiments Exercise

A. Extended Theory:

- 1. Explain entry controlled loop and exit controlled loop used in Java with example.
- 2. Explain the use of break and continue statement and differentiate between them.

B. Results/Observations/Program output:

Present the program input/output results and comment on the same.

C. Questions/Programs:

- 1. Write a Java program that counts number of alphabets, words, digits, special symbols and blank spaces in a given string.
- 2. Write a Java program to count vowels and consonants in a given string.

D. Conclusion:

- 1. Write what was performed in the experiment/program.
- 2. What is the significance of experiment/program?

3. Mention few applications of what was studied.

E. References

1. E. Balguruswamy, "Programming with java A primer", Fifth edition, Tata McGraw Hill Publication.
2. Learn to Master JAVA, from Star EDU solutions , by ScriptDemics.
3. www.programmingsimplified.com
4. www.javatpoint.com

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Subject: **Java Programming Lab**

Experiment-2: Java Program to implement classes, arrays and strings.

1. Aim: Write Java code to demonstrate the following:

- a) Command Line Arguments
- b) Scanner Class and BufferedReader Class
- c) Write a program that would print the information (name, year of joining, salary, address) of three employees by creating a class named 'Employee'.
The output should be as follows:

Name	Year of joining	Address
Robert	1994	64C- WallsStreat
Sam	2000	68D- WallsStreat
John	1999	26B- WallsStreat

- d) Write a java programs to add n strings in a vector array. Input new string and check whether it is present in the vector. If it is present delete it otherwise add it to the vector.
- e) Write a Java program to illustrate Constructor Chaining.

2. Prerequisite: Knowledge of class, arrays and vectors.

3. Requirements: Personal Computer (PC), Windows Operating System, Net beans 8.0.

4. Pre-Experiment Exercise:

Theory:

a. String Class:

The java.lang.String class provides a lot of methods to work on string. By the help of these methods, we can perform operations on string such as trimming, concatenating, converting, comparing, replacing strings etc. Java String is a powerful concept because everything is treated as a string if you submit any form in window based, web based or mobile application.

b. String Buffer Class:

Java String Buffer class is used to create mutable (modifiable) string. The StringBuffer class in java is same as String class except it is mutable i.e. it can be changed.

c. Array:

An array is a group of contiguous or related data elements that share a common name. A list of items can be given only one variable name and

such a variable is called an array. Like any other variables, arrays must be declared and created in the computer memory before they are used.

Creation of an array involves three steps:

1. Declaring the array
2. Creating memory locations
3. Putting values into the memory locations.

Java allows us to create arrays using 'new' operator only, as shown below:

1. One- Dimensional arrays:
arrayname=new type[size];
2. Multi- Dimensional arrays:
3. arrayname=new type[row][col];

d. **Vector:**

The Vector class implements a grow able array of objects. Like an array, it contains components that can be accessed using an integer index.

However, the size of a Vector can grow or shrink as needed to accommodate adding and removing items after the Vector has been created. Each vector tries to optimize storage management by maintaining a capacity and a capacity increment. The capacity is always at least as large as the vector size; it is usually larger because as components are added to the vector, the vector's storage increases in chunks the size of capacity increment. An application can increase the capacity of a vector before inserting a large number of components; this reduces the amount of incremental reallocation.

5. Laboratory Exercise

A. Procedure

- i. Open Net beans for Java.
- ii. Open File and Create New Java Project.
- iii. Inside the Java Project rename give name to your Java Class.
- iv. Click on Finish.
- v. Type the Java Code in the opened class.
- vi. Save the code by pressing Ctrl+S.
- vii. Run the code by pressing Shift+F6.

B. Program code with comments:

Write and execute your program code to achieve the given aim and attach it **with your own comments with neat indentation.**

6. Post-Experiments Exercise

A. Extended Theory:

1. Differentiate between Scanner Class and Buffered Reader Class.
2. Differentiate between String Class and String Buffer Class.
3. Explain any 20 methods of Vector Class with syntax.
4. Differentiate between Array and Vector.

B. Results/Observations/Program output:

Present the program input/output results and comment on the same.

C. Questions/Programs:

1. Write a Java program to implement 15 methods of Vector class.
2. Write a Java program to compare a String to a specified String Buffer.

D. Conclusion:

1. Write what was performed in the experiment/program.
2. What is the significance of experiment/program?
3. Mention few applications of what was studied.

E. References

1. Balguruswamy, "Programming with java A primer", Fifth edition, Tata McGraw Hill Publication.
2. Learn to Master JAVA, from Star EDU solutions , by ScriptDemics.
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4. www.javatpoint.com