



Vidyavardhini's
College of Engineering & Technology
Vasai Road (W)

Department of Artificial Intelligence & Data Science

Laboratory Manual

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Semester	III	Class	S.E.(2024-25)
Course Code	CSL304		
Course Name	Skill based Lab Course: Object Oriented Programming with Java		



Vidyavardhini's College of Engineering & Technology

Vision

To be a premier institution of technical education; always aiming at becoming a valuable resource for industry and society.

Mission

- To provide a technologically inspiring environment for learning.
- To promote creativity, innovation and professional activities.
- To inculcate ethical and moral values.
- To cater personal, professional and societal needs through quality education.



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

Department Vision:

To foster proficient artificial intelligence and data science professionals, making remarkable contributions to industry and society.

Department Mission:

- To encourage innovation and creativity with rational thinking for solving the challenges in emerging areas.
- To inculcate standard industrial practices and security norms while dealing with Data.
- To develop sustainable Artificial Intelligence systems for the benefit of various sectors.

Program Specific Outcomes (PSOs):

PSO1: Analyze the current trends in the field of Artificial Intelligence & Data Science and convey their findings by presenting / publishing at a national / international forum.

PSO2: Design and develop Artificial Intelligence & Data Science based solutions and applications for the problems in the different domains catering to industry and society.



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Department of Artificial Intelligence & Data Science

Program Outcomes (POs):

Engineering Graduates will be able to:

- **PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9. Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12. Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



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Course Objective

1	To learn the basic concept of object-oriented programming
2	To study JAVA Programming language
3	To study various concepts of JAVA programming like multithreading, exception handling, packages etc.
4	To explain components of GUI based application.

Course Outcomes

CO	At the end of course students will be able to:	Action verbs	Bloom's Level
CSL304.1	Apply the Object Oriented Programming and basic programming constructs for solving problems using JAVA.	Apply	Apply (level 3)
CSL304.2	Apply the concept of packages, classes , objects and accept the input using Scanner and Buffered Reader Class.	Apply	Apply (level 3)
CSL304.3	Apply the concept of strings, arrays, and vectors to perform various operations on sequential data.	Apply	Apply (level 3)
CSL304.4	Apply the concept of inheritance as method overriding and interfaces for multiple inheritance.	Apply	Apply (level 3)
CSL304.5	Apply the concept of exception handling using try, catch, finally, throw and throws and multithreading for thread management.	Apply	Apply (level 3)
CSL304.6	Develop GUI based application using applets and AWT Controls.	Develop	Create (level 6)



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Mapping of Experiments with Course Outcomes

List of Experiments	Course Outcomes					
	CSL304 .1	CSL304. 2	CSL304. 3	CSL304. 4	CSL304. 5	CSL304. 6
Implement a program using Basic programming constructs like branching and looping	3	-	-	-	-	-
Implement a program to accept the input from user using Scanner and Buffered Reader.	3	-	-	-	-	-
Implement a program that demonstrates the concepts of class and objects	-	3	-	-	-	-
Implement a program on method and constructor overloading.	-	3	-	-	-	-
Implement a program on Packages.	-	-	3	-	-	-
Implement a program on 2D array & strings functions.	-	-	3	-	-	-
Implement a program using super and final keyword.	-	-	-	3	-	-
Implement a program on Single inheritance.	-	-	-	3	-	-
Implement a program on Exception handling.	-	-	-	-	3	-



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Implement a program on User Defined Exception.	-	-	-	-	3	-
Implement a program on Applet or AWT Controls.	-	-	-	-	-	3
Mini Project based on the content of the syllabus (Group of 2-3 students)	-	-	-	-	-	3



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Sr. No.	Name of Experiment	D.O.P.	D.O.C.	Page No.	Remark
1	Implement a program using Basic programming constructs like branching and looping				
2	Implement a program to accept the input from user using Scanner and Buffered Reader.				
3	Implement a program that demonstrates the concepts of class and objects				
4	Implement a program on method and constructor overloading.				
5	Implement a program on Packages.				
6	Implement a program on 2D array & strings functions.				
7	Implement a program using super and final keyword.				
8	Implement a program on Single Inheritance with Interface.				
9	Implement a program on Exception Handling.				
10	Implement a program on User Defined Exception.				
11	Implement a program on Applet or AWT Controls				
12	Mini Project based on the content of the syllabus (Group of 2-3 students)				

D.O.P: Date of performance

D.O.C : Date of correction



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Experiment No.1
Basic programming constructs like branching and looping
Date of Performance:
Date of Submission:



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Aim :- To apply programming constructs of decision making and looping.

Objective :- To apply basic programming constructs like Branching and Looping for solving arithmetic problems like calculating factorial of a no entered by user at command prompt .

Theory :-

Programming constructs are basic building blocks that can be used to control computer programs. Most programs are built out of a fairly standard set of programming constructs. For example, to write a useful program, we need to be able to store values in variables, test these values against a condition, or loop through a set of instructions a certain number of times. Some of the basic program constructs include decision making and looping.

Decision Making in programming is similar to decision making in real life. In programming also, we face some situations where we want a certain block of code to be executed when some condition is fulfilled. A programming language uses control statements to control the flow of execution of a program based on certain conditions. These are used to cause the flow of execution to advance, and branch based on changes to the state of a program.

- if
- if-else
- nested-if
- if-else-if
- switch-case
- break, continue

These statements allow you to control the flow of your program's execution based upon conditions known only during run time.

A loop is a programming structure that repeats a sequence of instructions until a specific condition is met. Programmers use loops to cycle through values, add sums of numbers, repeat functions, and many other things. ... Two of the most common types of loops are the while loop and the for loop. The different ways of looping in programming languages are

- while
- do-while



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- for loop
- Some languages have modified for loops for more convenience eg :- Modified for loop in java.

For and while loop is entry-controlled loops. Do-while is an exit-controlled loop.

Code: -

```
public class spring {
```

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

```
        // Example of a for loop
```

```
        System.out.println("using For Loop:");
```

```
        for (int i = 0; i < 5; i++) {
```

```
            if (i == 3) {
```

```
                System.out.println("Breaking out of the loop at i = " + i);
```

```
                break; // Exiting the loop when i == 3
```

```
            }
```

```
            System.out.println("i = " + i);
```

```
        }
```

```
        // Example of a while loop
```

```
        System.out.println("\nusing While Loop:");
```

```
        int j = 0;
```

```
        while (j < 5) {
```

```
            if (j == 2) {
```

```
                System.out.println("Skipping the print statement when j = " + j);
```

```
                j++; // Incrementing j without using 'continue'
```

```
                continue; // Skips the rest of the loop body, not recommended but using to demonstrate
```

```
            }
```

```
            System.out.println("j = " + j);
```

```
            j++;
```

```
        }
```

```
        // Example of a do-while loop
```



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```
System.out.println("\nusing Do-While Loop:");
int k = 0;
do {
    if(k == 4) {
        System.out.println("Exiting the program at k = " + k);
        return; // Exiting the method using return
    }
    System.out.println("k = " + k);
    k++;
} while (k < 5);

// If this point is reached, it means the return statement was not executed
System.out.println("End of the program");
}
}
```

Output:

```
xScredhat.java\x5cjd_tws\x5cmini project_34e65f4b\x5cbin\ 'spring' ;c37059ad-9f57-4e4d-b281-96dea1d80ecfusing For Loop:
i = 0
i = 1
i = 2
Breaking out of the loop at i = 3

using While Loop:
j = 0
j = 1
Skipping the print statement when j = 2
j = 3
j = 4

using Do-While Loop:
k = 0
k = 1
k = 2
k = 3
Exiting the program at k = 4
```



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Conclusion:

In summary, branching and looping are powerful tools that enhance the capability of programs to handle a variety of scenarios, improve code efficiency, and simplify complex problem-solving processes. They allow developers to create responsive, adaptable, and maintainable applications, making them indispensable in programming.