**BITS PILANI, DUBAI CAMPUS**
**DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI**

**FIRST SEMESTER 2025 – 2026**
**COURSE:** CSF213/ECOM213/MACF212 (Object Oriented Programming)
**COMPONENT:** Lab 7 **Week: 7**

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**Aim:**
To understand and implement the use of the ArrayList class in Java for managing collections of data, and to apply object-oriented principles by creating and manipulating objects stored in an ArrayList.

**Objective:**

- Learn basic ArrayList operations such as adding, removing, updating, and searching elements.
- Implement real-world problems using ArrayList of objects.
- Strengthen understanding of iteration and collection-based programming in Java.

**Problem Statements:**

1. Write a Java program that demonstrates the use of an ArrayList by managing a list of student names. The program should:
    a) Create an ArrayList<String> to store student names.
    b) Insert **five student names** into the list.
    c) Display the list of student names after insertion.
    d) Remove the **3rd student**.
    e) Add a new student name at the **2nd position**.
    f) Update/replace the **last student's name** with a new name.
    g) Check if a specific student name (entered by the user) exists in the list.
    h) Display the **final list of student names** after all modifications.
    i) Traverse the list in **reverse** direction

**Example Input and Output:**

```
Initial Student List: [Alice, Bob, Charlie, David, Eva]
After Removing 3rd Name: [Alice, Bob, David, Eva]
After Adding "Frank" at 2nd Position: [Alice, Frank, Bob, David, Eva]
After Updating Last Name to "Grace": [Alice, Frank, Bob, David, Grace]
Enter a name to search: Bob
Bob is present in the list.
Final list of Student names: [Alice, Frank, Bob, David, Grace]
Final Student List (Reverse): [Grace, David, Bob, Frank, Alice]
```

2. Write a Java program to manage attendance records of employees. The program should perform the following tasks:

a) **Define Employee Class:** Create a class Employee with the following attributes:

- empId (int)
- name (String)
- daysPresent (int)

b) **Store Employees in ArrayList:** Create an ArrayList<Employee> to store multiple employee objects. Add at least **five employees** with different attendance records.

c) **Display All Employees:** Display details of all employees, showing their employee ID, name, and days present.

d) **Search by Employee ID:** Prompt the user to enter an empId and search for the corresponding employee in the list. Display their attendance if found, or an appropriate message if the employee does not exist.

e) **Filter Employees with Low Attendance:** Display details of employees whose attendance is **less than 20 days**. This helps identify employees with insufficient attendance for further action.

**Example Input and Output:**

```
All Employees:

101 Alice 22

102 Bob 18

103 Charlie 25

104 David 15

105 Eva 20

Enter Employee ID to search: 102

Employee Found: Bob - Days Present: 18

Employees with attendance less than 20 days:

102 Bob 18

104 David 15
```