Experiment 4

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Subject: Java **Subject Code:22CSH-359**

Aim: Develop Java programs using core concepts such as data structures, collections, and multithreading to manage and manipulate data.

Objective: Write a Java program to implement an ArrayList that stores employee details (ID, Name, and Salary). Allow users to add, update, remove, and search employees.

Algorithm:

1.) Define Data Structure:
- Create an Employee class/structure with:
  - Integer id
  - String name
  - Double salary

2.) Initialize Data Storage:
- Create an empty list (e.g., ArrayList<Employee>) to hold employee objects.

3.) Main Loop:
- Repeat until the user chooses to exit:
  1) Display Menu Options:
     - "1. Add Employee"
     - "2. Update Employee"
     - "3. Remove Employee"
     - "4. Search Employee"
     - "5. Display All Employees"
     - "0. Exit"
  2) **Input Choice**:
- Read the user's menu option (e.g., as an integer).

4.) Process User Choice:
- **If** choice is **1 (Add Employee):**

1. Prompt the user to enter Employee ID.
2. Prompt the user to enter Employee Name.
3. Prompt the user to enter Employee Salary.
4. Create a new Employee object with the provided details.
5. Add the new employee to the list.
6. Display a success message.

- **If** choice is **2 (Update Employee):**

1. Prompt the user to enter the Employee ID to update.
2. Search for the employee in the list using the given ID.
3. If the employee exists:
   - Prompt the user to enter the new Name.
   - Prompt the user to enter the new Salary.

- Update the employee's name and salary.
- Display a success message.

4. **Else**:
   - Display a "not found" message.

- **If** choice is **3 (Remove Employee):**

1. Prompt the user to enter the Employee ID to remove.
2. Search for the employee in the list using the given ID.
3. If the employee exists:
   - Remove the employee from the list.
   - Display a success message.
4. **Else**:
   - Display a "not found" message.

- **If** choice is **4 (Search Employee):**

1. Prompt the user to enter the Employee ID to search.
2. Search for the employee in the list using the given ID.
3. If the employee exists:
   - Display the employee's details.
4. **Else**:
   - Display a "not found" message.

- **If** choice is **5 (Display All Employees):**

1. If the employee list is empty:
   - Display a message indicating no employees to show.
2. **Else**:
   - Iterate over the list and display each employee's details.

- **If** choice is **0 (Exit):**
  - Terminate the program loop.

5.) End Program

Code:

```
import java.util.ArrayList;
import java.util.Scanner;
class Employee {
    private int id;
    private String name;
    private double salary;
    public Employee(int id, String name, double salary) {
        this.id = id;
        this.name = name;
        this.salary = salary;
    }
    public int getId() { return id; }
    public String getName() { return name; }
    public double getSalary() { return salary; }
    public void setName(String name) { this.name = name; }
    public void setSalary(double salary) { this.salary = salary; }
    @Override
    public String toString() {
        return "Employee ID: " + id + ", Name: " + name + ", Salary: " + salary;
    }
}
public class EmployeeManagement {
```

```
private static ArrayList<Employee> employees = new ArrayList<>();
private static Scanner scanner = new Scanner(System.in);

public static void main(String[] args) {
    int choice;
    do {
        System.out.println("\nEmployee Management System");
        System.out.println("1. Add Employee");
        System.out.println("2. Update Employee");
        System.out.println("3. Remove Employee");
        System.out.println("4. Search Employee");
        System.out.println("5. Display All Employees");
        System.out.println("0. Exit");
        System.out.print("Enter your choice: ");
        choice = scanner.nextInt();
        scanner.nextLine();
        switch(choice) {
            case 1: addEmployee(); break;
            case 2: updateEmployee(); break;
            case 3: removeEmployee(); break;
            case 4: searchEmployee(); break;
            case 5: displayEmployees(); break;
            case 0: System.out.println("Exiting..."); break;
            default: System.out.println("Invalid choice. Try again.");
        }
    } while(choice != 0);
}
private static void addEmployee() {
    System.out.print("Enter Employee ID: ");
    int id = scanner.nextInt();
    scanner.nextLine();
    System.out.print("Enter Employee Name: ");
    String name = scanner.nextLine();
    System.out.print("Enter Employee Salary: ");
    double salary = scanner.nextDouble();
    scanner.nextLine();
    employees.add(new Employee(id, name, salary));
    System.out.println("Employee added successfully.");
}
private static void updateEmployee() {
    System.out.print("Enter Employee ID to update: ");
    int id = scanner.nextInt();
    scanner.nextLine();
    Employee emp = findEmployeeById(id);
    if(emp != null) {
        System.out.print("Enter new Name: ");
        String name = scanner.nextLine();
        System.out.print("Enter new Salary: ");
        double salary = scanner.nextDouble();
        scanner.nextLine();
        emp.setName(name);
        emp.setSalary(salary);
        System.out.println("Employee updated successfully.");
```

```
        } else {
            System.out.println("Employee not found.");
        }
    }
    private static void removeEmployee() {
        System.out.print("Enter Employee ID to remove: ");
        int id = scanner.nextInt();
        scanner.nextLine();
        Employee emp = findEmployeeById(id);
        if(emp != null) {
            employees.remove(emp);
            System.out.println("Employee removed successfully.");
        } else {
            System.out.println("Employee not found.");
        }
    }
    private static void searchEmployee() {
        System.out.print("Enter Employee ID to search: ");
        int id = scanner.nextInt();
        scanner.nextLine();
        Employee emp = findEmployeeById(id);
        if(emp != null) {
            System.out.println("Employee found: " + emp);
        } else {
            System.out.println("Employee not found.");
        }
    }
    private static void displayEmployees() {
        if(employees.isEmpty()) {
            System.out.println("No employees to display.");
        } else {
            System.out.println("Employee List:");
            for(Employee emp : employees) {
                System.out.println(emp);
            }
        }
    }
    private static Employee findEmployeeById(int id) {
        for(Employee emp : employees) {
            if(emp.getId() == id) {
                return emp;
            }
        }
        return null;
    }
}
```

Learning Outcomes:

1. Demonstrate: Apply key concepts to real-world scenarios to showcase understanding.
2. Analyze: Critically evaluate information, identify patterns, and draw meaningful conclusions.

3. Create: Develop original work, including presentations, reports, or projects, to exhibit comprehension and skills.
4. Communicate: Convey ideas and findings effectively through oral and written communication.
5. Collaborate: Contribute to group projects and exhibit strong teamwork capabilities in a collaborative environment.

Output:

```
Employee Management System
1. Add Employee
2. Update Employee
3. Remove Employee
4. Search Employee
5. Display All Employees
0. Exit
Enter your choice: 5
Employee List:
Employee ID: 17209, Name: Vishwas, Salary: 1500000.0
Employee ID: 17134, Name: Rajat, Salary: 1150000.0
```