

# EXPERIMENT 9

## Question:

A college has more than thousand security persons, who are instructed to give duties at different places within the campus. Additionally, they also maintain a routine, which contains all information, such as Date, Duty Start Time, Duty End Time, and Place. Most importantly, all the places are covered by at least one security person. If a security person takes leave, manual entry is done against that person. Finally, at the end of a month, the security persons get paid for their duties, while considering the number of leaves as well. You can see that the manual calculation/operation is a heavy task for the security manager. Therefore, the objective is to build an Online security management system using class diagram through which entire security system within the campus can be controlled in an efficient manner

## Aim:

To develop an **Online Security Management System** using a **Class Diagram** that efficiently manages security personnel, their duty schedules, leave records, and salary calculations, reducing manual workload and improving operational efficiency

## Procedure:

### 1. Identify Key Entities

- The system involves different roles such as Security Person, Security Manager, Leave Management, Duty Schedule, and Payroll Processing.
- Each entity represents a class in the UML class diagram.

### 2. Define Attributes for Each Class

- **SecurityPerson:** Contains attributes like SecurityID, Name, ContactInfo, assignedDuty, leaveRecords, and Salary.
- **SecurityManager:** Includes ManagerID, Name, and ContactInfo.
- **LeaveManagement:** Attributes like LeaveID, SecurityPerson, Date, and Status.
- **DutySchedule:** Holds ScheduleID, Date, startTime, endTime, Location, and assigned SecurityPerson.
- **PayrollProcessing:** Contains PayrollID, SecurityPerson, totalDuties, leavesTaken, and salaryAmount.

### 3. Define Relationships Between Classes

- The Security Manager assigns duties to Security Persons.

- Security Persons can request leave through the Leave Management system.
- The Leave Management class processes leave requests and updates Duty Schedule accordingly.
- Payroll Processing calculates salaries based on the number of duties completed and leaves taken.

#### 4. Define Class Methods

- **SecurityPerson:** Can request leave, view schedules, and update contact details.
- **SecurityManager:** Assigns duties, approves leaves, and generates salary reports.
- **LeaveManagement:** Handles leave requests and approvals.
- **DutySchedule:** Assigns security personnel and checks duty coverage.
- **PayrollProcessing:** Calculates salaries and generates payslips.

#### 5. Draw the UML Class Diagram

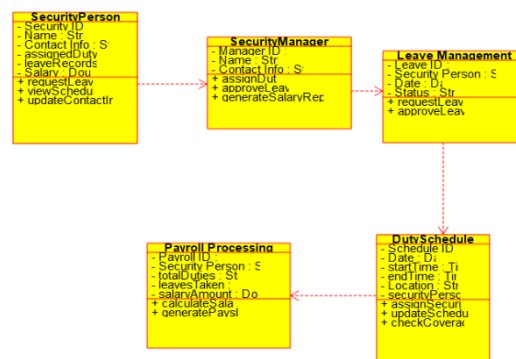
- Using UML notation, each class is represented as a box with three sections: Class Name, Attributes, and Methods.
- Relationships between classes are shown using associations (dotted arrows), aggregation, and inheritance where applicable.

#### 6. Review and Refine

- Ensure all necessary relationships and attributes are included.
- Validate the diagram to ensure it meets the system requirements effectively.

#### Output:

#### Class Diagram



## **Result**

The UML Class Diagram streamlines security duty allocation, leave tracking, and salary computation, reducing manual workload and improving efficiency. The system ensures an organized and automated workflow for security personnel management.