Software Requirements Specification

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Project Title: Face Recognition And Object Detection For Company

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Author(s): RAZEEN H

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Abstract:

The "Face Recognition and Object Detecting Software" project aims to develop a software tool that can accurately detect and recognize faces and objects in real-time. The software will use advanced computer vision and machine learning techniques to identify and classify faces and objects in images and video streams. The software will be designed to be user-friendly, efficient, and scalable, making it suitable for use in a wide range of applications, such as security, surveillance, and automation.

To achieve these goals, the project team will use state-of-the-art computer vision and machine learning algorithms to train the software to detect and recognize faces and objects in a variety of environments and conditions. The team will also optimize the software for real-time performance, ensuring that it can process images and video streams quickly and accurately.

Objective and Scope

Objective:

The objective of the face recognition and object detection software for a company employee is to automate the attendance process and track the employee's attendance details for salary calculation. it eliminates the need for physical contact, which is especially important in the previse pandemic situation where hygiene is a major concern and Face recognition technology can also be used for security purposes, as it can detect unauthorized individuals and alert the authorities in real-time.

Scope:

- The system will use face recognition technology to mark the attendance of the employee.
- The system will capture the in and out time of the employee.
- The system will calculate the attendance percentage of the employee.

- The system will track the employee's previous attendance records for salary calculation.
- The system will generate salary reports based on the employee's attendance and salary details.

Project End Users

The end users of the project are the employees of the company who will use the software to record their attendance and calculate their salary .The employees will be able to easily check their attendance records and salary information.

Module description:

- **Face detection module -** detects faces in the image or video
- **Face recognition module -** recognizes faces and maps them to employee records
- **Object detection module** - detects objects in the image or video (e.g. badge, laptop, etc.)
- **Time tracking module** - records employee in and out times
- **Attendance tracking module** - calculates attendance percentage based on in and out times
- **Payroll module** - calculates the salary for the employee based on attendance and pay rate
- **Reporting module** - generates reports for attendance, salary, etc.
- **User management module** - manages user accounts and permissions
- **Configuration module** - allows customization of the system settings
- **Alerts module** - sends alerts for various events (e.g. missed punches, late arrival, etc.)
- **Data management module** - manages employee records, attendance data, and payroll information
- **Database module** - manages the system database
- **System integration module** - integrates the system with existing payroll and HR systems
- **Security module** - ensures system security and prevents unauthorized access

- **Camera integration module** - integrates with various types of cameras and video feeds
- **System maintenance module** - allows for system updates and maintenance
- **Helpdesk module** - provides user support and troubleshooting
- **Training module** - provides training resources and materials for users
- **Scalability module** - allows for system scalability to handle increasing employee numbers and data volume.

Functional requirements:

- The software should be able to recognize and detect employees' faces accurately.
- The software should record the in and out time of each employee.
- The software should calculate the attendance percentage of each employee based on their in and out time.
- The software should calculate the salary of each employee based on the number of days they worked and their salary per day.
- The software should provide reports on employee attendance, including the attendance percentage, total working days, and salary.

Non-functional requirements:

- The software should have high accuracy in recognizing and detecting employee faces.
- The software should have a fast processing speed to record employee in and out time.
- The software should be able to handle a large number of employees.
- The software should be user-friendly and easy to navigate.
- The software should be secure and protect employee data privacy.

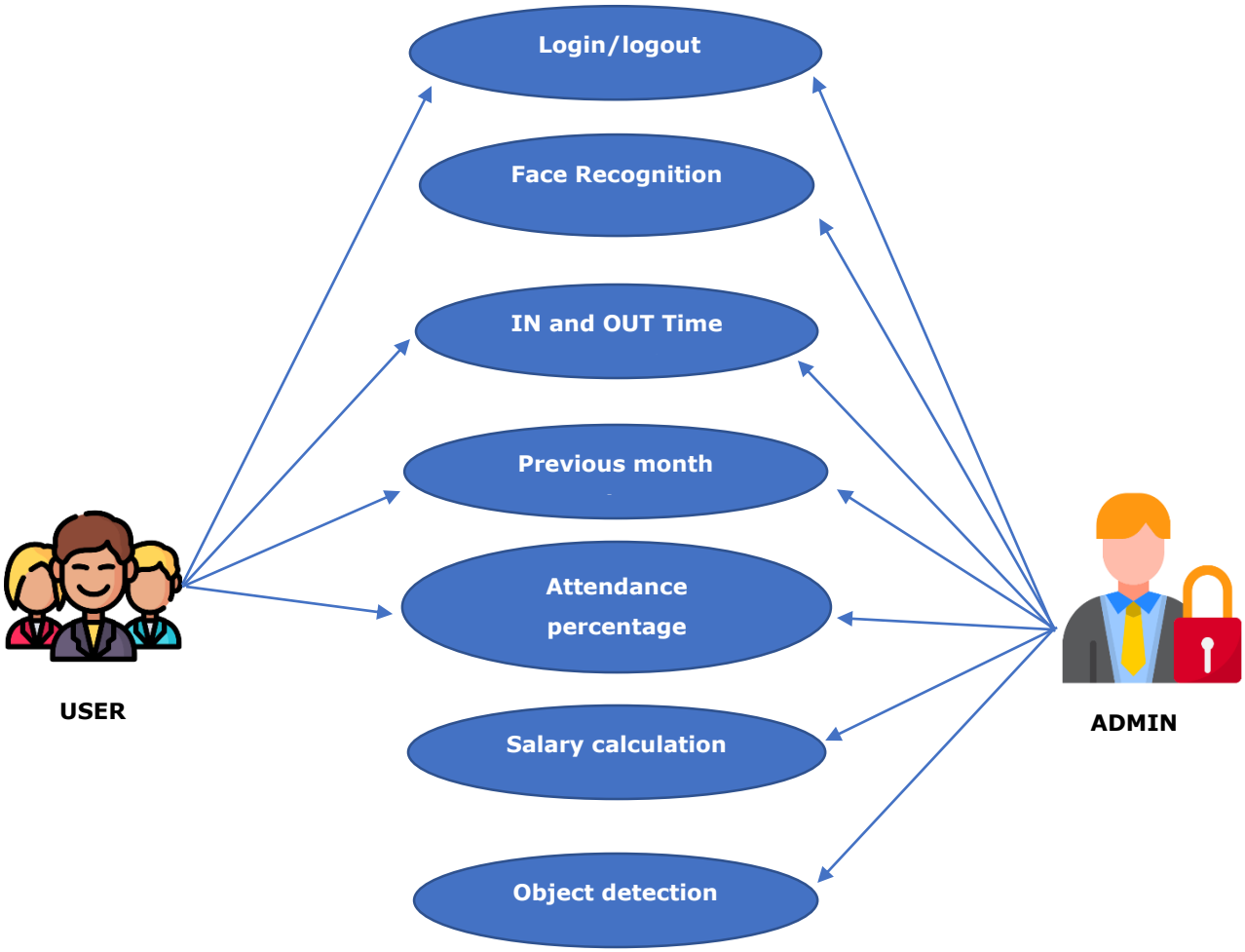
Lower Level Design:

- Face Detection: Implement face detection algorithm to identify the face region in the image.
- Face Alignment: Implement face alignment algorithm to align the face in the detected region.
- Feature Extraction: Extract unique features from the aligned face for recognition.
- Face Recognition: Implement face recognition algorithm to recognize the employee face.
- Object Detection: Implement object detection algorithm to detect the employee ID card and extract the employee ID.

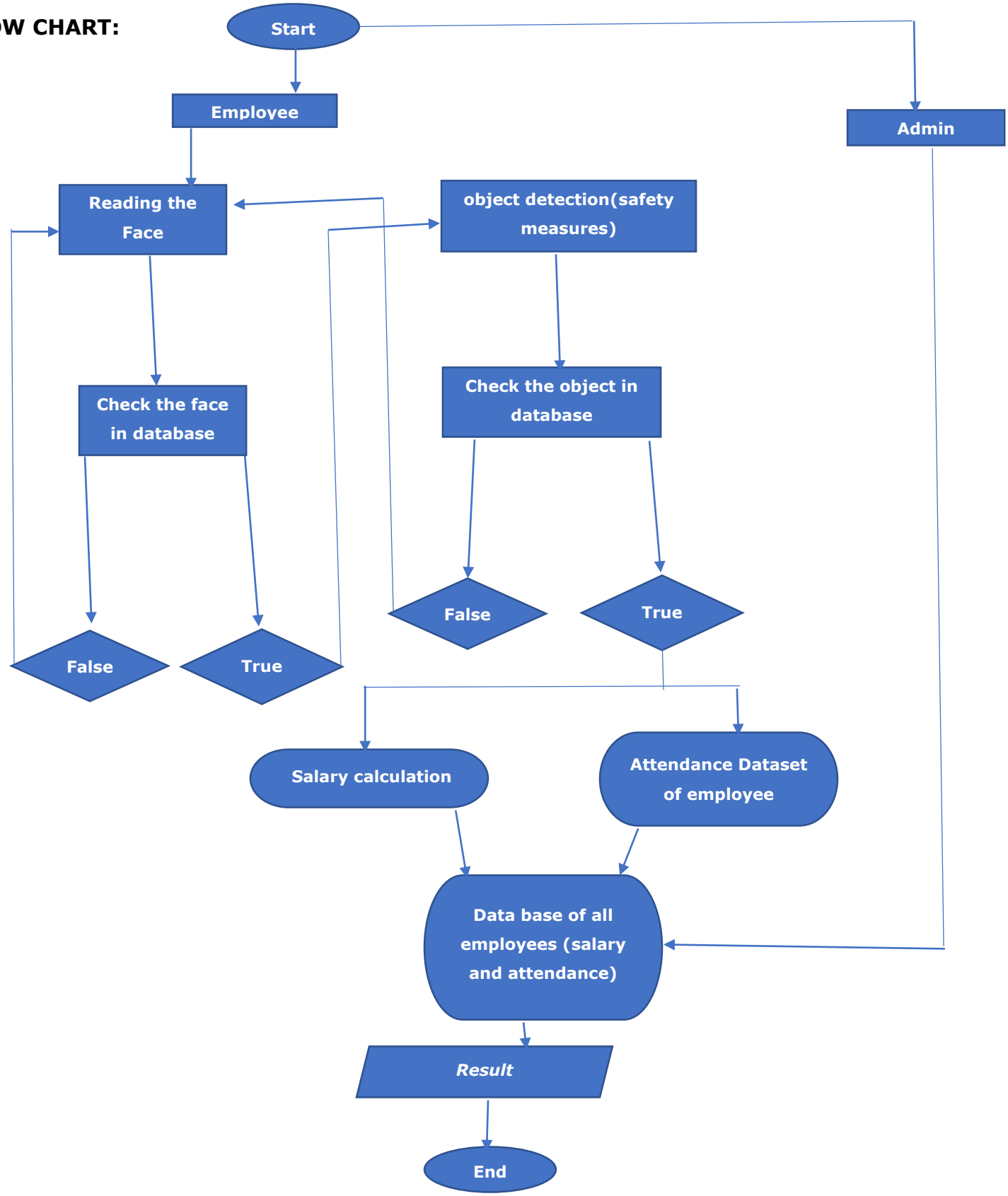
High Level Design:

- User Interface: Develop a user-friendly interface for employees and admin to view attendance records, salary details, etc.
- Database: Set up a database to store employee information, attendance records, and salary details.
- Face Recognition Module: Integrate face detection, face alignment, feature extraction, and face recognition algorithms to recognize employee faces.
- Object Detection Module: Integrate object detection algorithm to detect employee ID cards.
- Attendance Module: Develop an attendance module to record employee in/out time, attendance percentage, etc.
- Salary Module: Develop a salary module to calculate employee salary based on attendance records.
- Admin Module: Develop an admin module to manage employee records, view attendance reports, and manage salary details.
- Security Module: Implement security measures such as encryption to protect employee data.
- Integration: Integrate all the modules into a complete system.

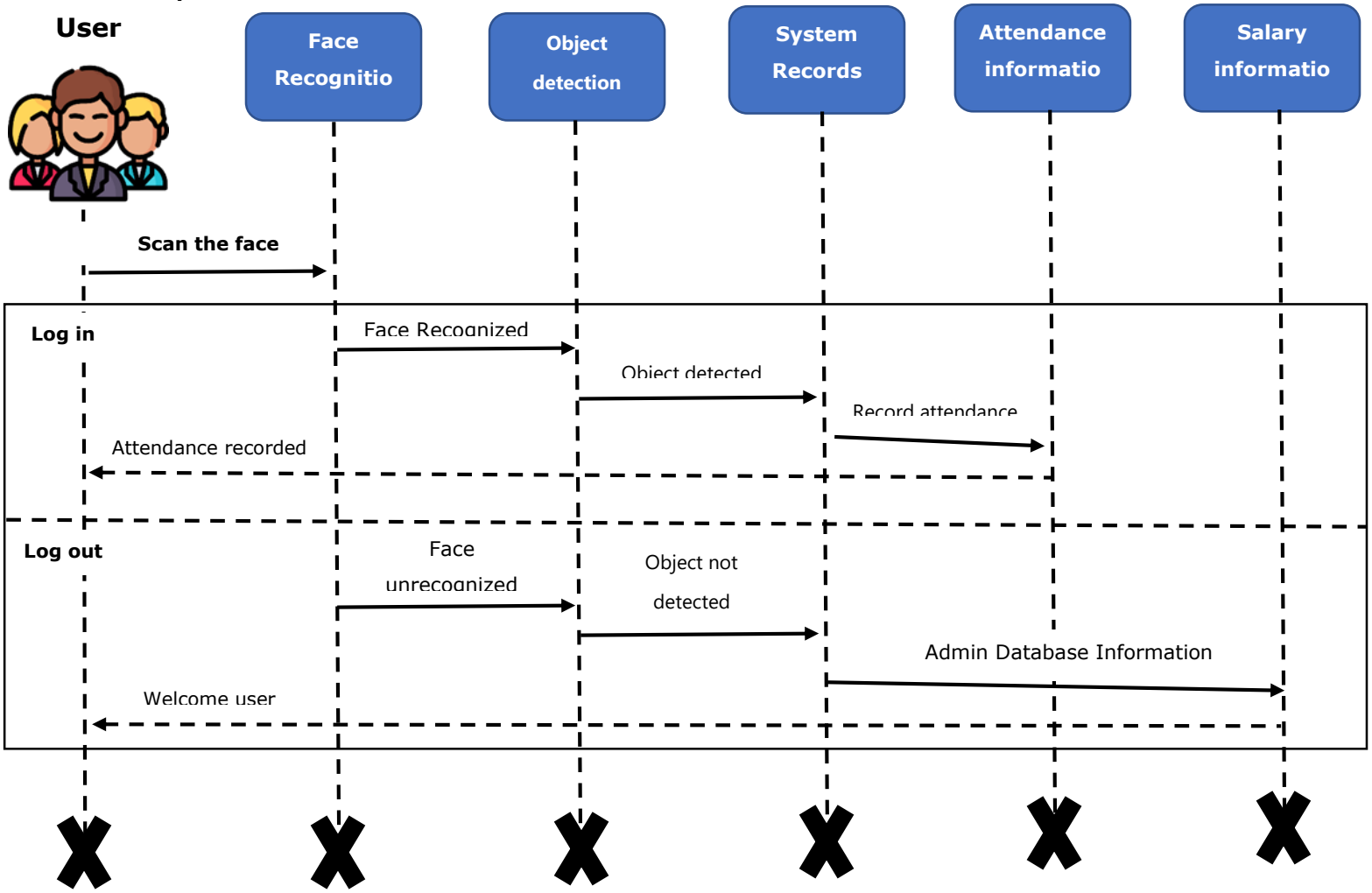
Use Case Diagram :



FLOW CHART:


Start
Employee
Admin
Reading the Face
object detection(safety measures)
Check the face in database
Check the object in database
False
True
False
True
Salary calculation
Attendance Dataset of employee
Data base of all employees (salary and attendance)
Result
End

SEQUENCE DIAGRAM:



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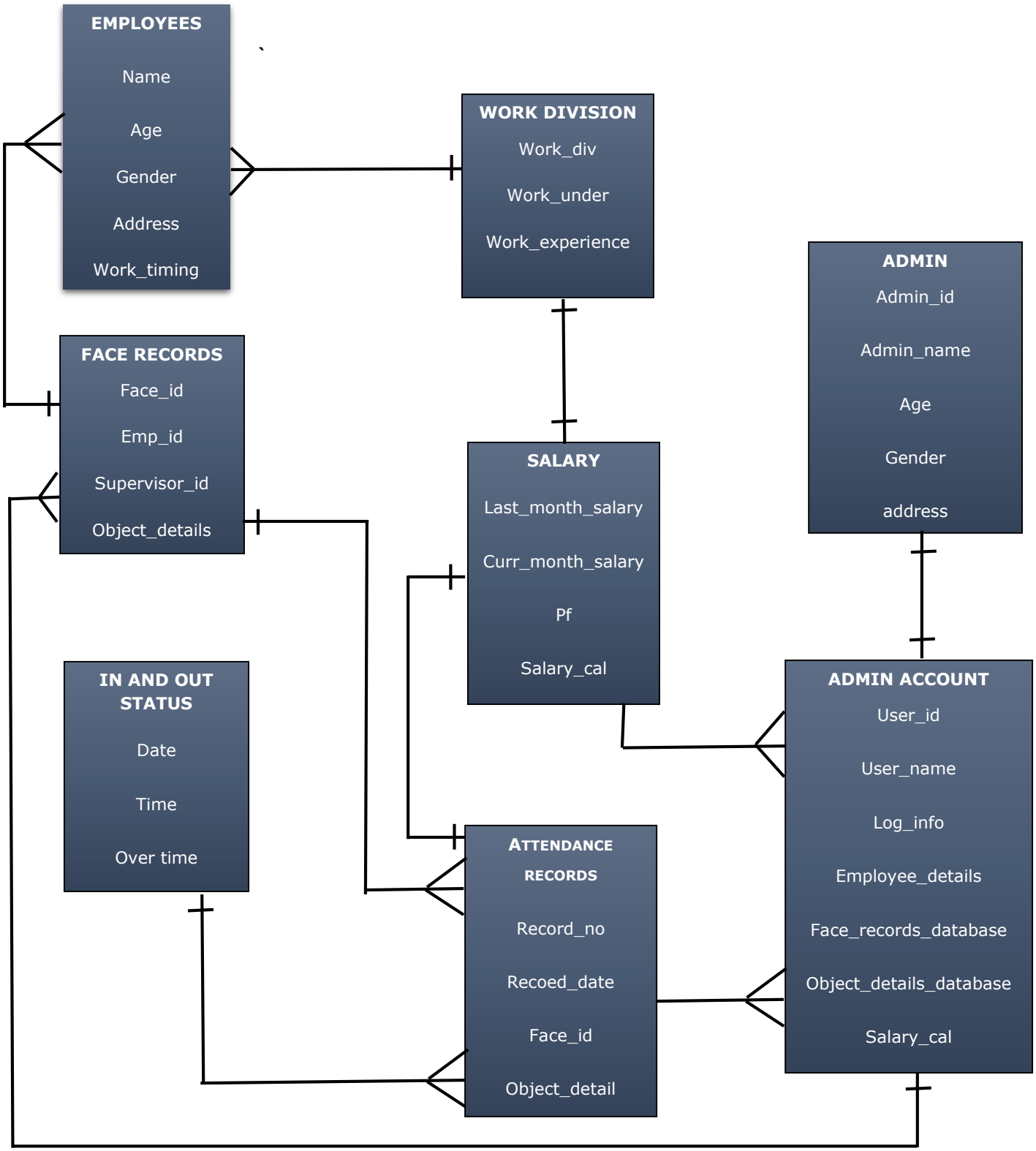
EMPLOYEES
Name
Age
Gender
Address
Work_timing
WORK DIVISION
Work_div
Work_under
Work_experience
ADMIN
Admin_id
Admin_name
Age
Gender
address
FACE RECORDS
Face_id
Emp_id
Supervisor_id
Object_details
SALARY
Last_month_salary
Curr_month_salary
Pf
Salary_cal
IN AND OUT STATUS
Date
Time
Over time
ADMIN ACCOUNT
User_id
User_name
Log_info
Employee_details
Face_records_database
Object_details_database
Salary_cal
ATTENDANCE RECORDS
Record_no
Recoed_date
Face_id
Object_detail