SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION SYSTEMS

SEG2202 SOFTWARE ENGINEERING

ACADEMIC SESSION: AUGUST 2021

FINAL ASSESSMENT PROJECT **DUE DATE: 29 NOVEMBER 2021**

STUDENT NAME:	**CHEW CHIEN ZHEN**
STUDENT ID:	**19037746**
PROGRAMME:	**BSE**
YEAR / SEMESTER:	**2**
PROJECT TITLE:	**Android Employee Tracker**

INSTRUCTIONS TO CANDIDATES

- This is an **INDIVIDUAL** project.
- The total mark for this project is **100%**.
- The project mark will contribute to 50% of the Final Assessment component.

IMPORTANT NOTICE

The University requires students to adhere to submission deadlines for any form of assessment. Penalties are applied in relation to all late submission of work. Project submitted after the deadline will be regarded as a non-submission and marked zero.

Academic Honesty Acknowledgement

"I .....Chew Chien Zhen..... (student name) verify that this paper contains entirely my own work. I have not consulted with any outside person or materials other than what was specified (an interviewee, for example) in the assignment or the syllabus requirements. Further, I have not copied or inadvertently copied ideas, sentences, or paragraphs from another student. I realize the penalties *(refer to page 16, 5.5, Appendix 2, page 44 of the student handbook diploma and undergraduate programme)* for any kind of copying or collaboration on any assignment."

…….....Zhen / 14.11.20201..... (Student's signature / Date)

Table of Content

Android Employee Tracker

1.0 Introduction

Many companies around commonly would have a certain number of employees working under them and those companies would like to know about the employees efforts and effort they are giving to the company which can only be the means to measure and determine the company's productivity. Different companies have different ways of keeping track with their employee's whereabouts and also to monitor the effort of each employee as well as keeping track of the productivity scaling which may vary between companies. This tracking system could potential server more than one purpose to any company who are competing in the market using it.

The system can present itself useful for work places like a work building or work requirements that includes extensive travelling of the employees to specific locations on the map. Many would also debate that such a system can be useful only for marketing which requires extensive travelling as part of the said job. But this system has more than meets the eye where the system could be made functional based of the company's functional requirements and needs. Besides that, it also makes is easier to monitor the employees in the admin department to have a time saving, fool proof way in monitoring the employees worktime and generate the paycheck based off the employee's login/logout timestamps.

Project Objectives and Project Scope

2.0 Project objectives

The objectives of this project is to monitor the employee's whereabouts as well as track the employees locations visited and the work hours spent on the field. With the login/logout system, the employee's attendance can be monitored, recorded, and sent to the admin interface for easy monitoring which results in easier salary paycheck for employees individually.

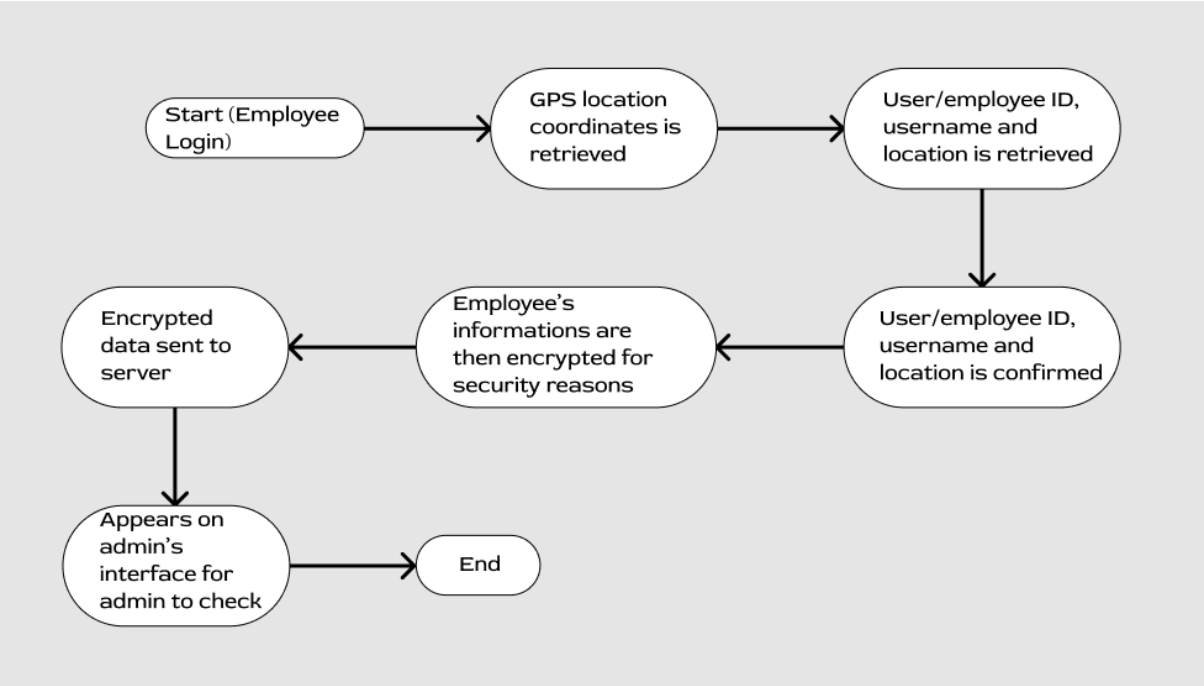
Companies usually make it a must use condition for employees who are on the field almost daily as it saves a lot of time and effort as well as minimalizing casualties when it comes to attendance and paycheck issues. Also, with the system having every employee under a unique ID for each and everyone of them, makes the system almost fool proof for attendance cheating like attendance forging. It also requires the employee on the field to set the devices in a status to show that they are online/active and carrying out their duties which serves as a decent fool proof wall on their attendance at work. These are the front-page objectives of the system to be recognized universally and might be a solution to a lot of problems which employers of a company may be facing.

3.0 Project scope

- The Android Employee Tracker is an application where it involves the use of the web as well as Android where the user as well as the admin uses the android application which also works with the web application. This application, just like the name state suggested, is meant for Employers employing employee on the field.
- The application will be in the Employee's android device(phone). The user will have to turn on his GPS location before logging in to the system and his location will be sent to the admin where the admin will be able to view the location and employee id.
- When the employee logout the system the time tracker stops and the GPS location and time of logout is recorded and send to the admin
- Salary of the employee is dependent on the tracking hours
- With this app, the admin can keep track of the time, location and coordinates of the employees.

4.0 Software Process Model

A flowchart of the software process taking place.



5.0 Requirements Plan

To carry out this project which consist of a developing phase and a production phase that is a prototype which requires certain hardware devices and software that are compatible and meet a specific spec threshold.

Hardware Devices spec requirements

Desktop or laptop (admin usage)

1) 4GB RAM (Optimal threshold)
2) 10GB Hard drive(for data Storage)
3) I5 processor

Phone or Tablet that is Android supported (Employee usage)

1) 2GB RAM (Optimal Threshold)
2) 1.1 GHz quad-core processor
3) 2G and above compatibility

Stakeholders

- Admins
- Employees

6.0 System Functionality

Add and locate the user/employee:

Stakeholders:

- Admin:
  - Add new employees that were newly recruited
  - Able to see and locate the current as well a previous location of the employee/user to check and ensure the employee's field time.
  - Also, to know the Employee's activity and assigned work field based off the location.

Conditions before and after admin authentication:

- Pre-authentication:
  - Admin must identify themselves through login credentials authentication and a follow up of special questions to confirm the admin's identity

- Post-authentication:
  - Admin can view the current location of the employee as well view the history of previous locations of the employee. Admin can also check the field time (worktime hours) of the employee.

Once the admin is logged in:

- Add and select the user/employee:
  - Admin can add new employees into the employee list
  - Admin can also select any employee/user from the list and view current location of selected employee.
  - Admin can view the location of a logged in employee only

- Admin can also view location history of any employee through the date and time

Special functions:

- System will auto refresh current locations periodically once every 4 minutes of a logged in employee
- If employee lost connection after logging in, system will refresh and check employee's status periodically every 10 minutes
- If employee does not reconnect after 45 minutes, the system will update the status of the employee as logged out and stops further location-tracking.

Technology involved:

- Location and GPS services are required
- Google map link

Frequency of the system's function:

- When the admin wants to check an employee that is working on the field.

Edit Salary and check Work hours:

Stakeholders:

- Admin:
  - To check the employee's workhours and salary during a specific date and month.
  - Wants to check the employee's salary and workhours during a specific month
  - To edit employee's monthly salary

Pre and post conditions of the admin to view employee's salary and workhours:

- Pre-condition:
  - Admin must be authenticated and logged in
- Post-condition:
  - The salary and work time of the employee is displayed based off date and month for the admin to see.
  - Admin is authorized to edit the information

When the admin is checking the data of the employee:

- Admin selects an employee from the list of employees in the system
- Admin selects the month desired
- Employee's monthly salary is displayed as well as the work time spent during the month selected by the admin.
- Admin can also make any necessary edits to the employee's information on the database

No special functions or any special technologies required.

Frequency of the checking process:

- When the admin logs in and wants to check the salary and worktime of the selected employee.

GPS location tracker:

Stakeholders:

- Employee:
  - To send data and identity of the employee's current location in the field.

Pre and post conditions of the employee to enable GPS tracking of the employee's locations:

- Pre-condition:
  - Employee must be logged into the system with the device GPS set to ON
- Post-condition:
  - Location of the employee is updated and stored in the database for the admin to view

When the employee is on the field:

- Employee has already logged into the system and turned his GPS on
- System captures the current location of the logged in employee and records it in the database
- Every 4 minutes, the system will recapture the GPS location and update the current location of the employee as long as the employee is logged in

When the employee logs out:

- The system will stop tracking the location of the employee and records the duration of the employee's logged in hours.

Technology involved:

- GPS, Internet connectivity or hotspots, Satellite

Frequency of the tracking process:

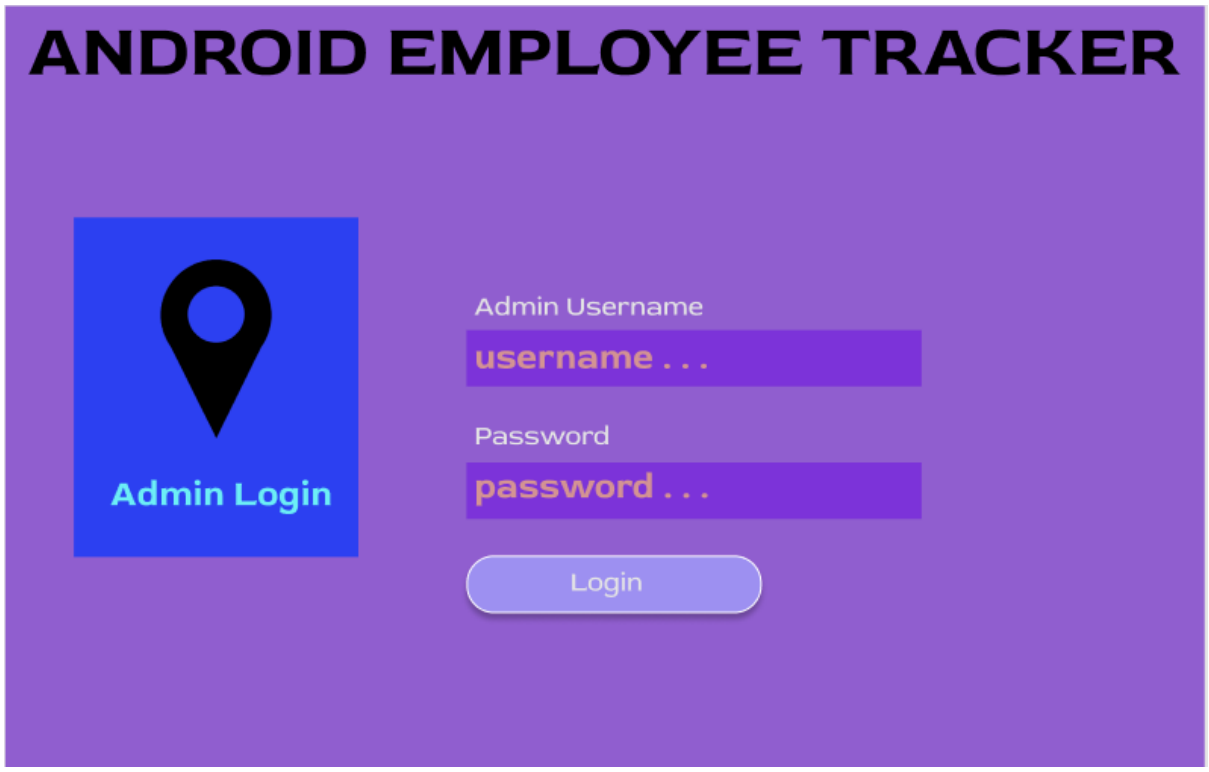
- Every 4 minutes after the employee logs in until the employee logs out.

7.0 Prototype Design

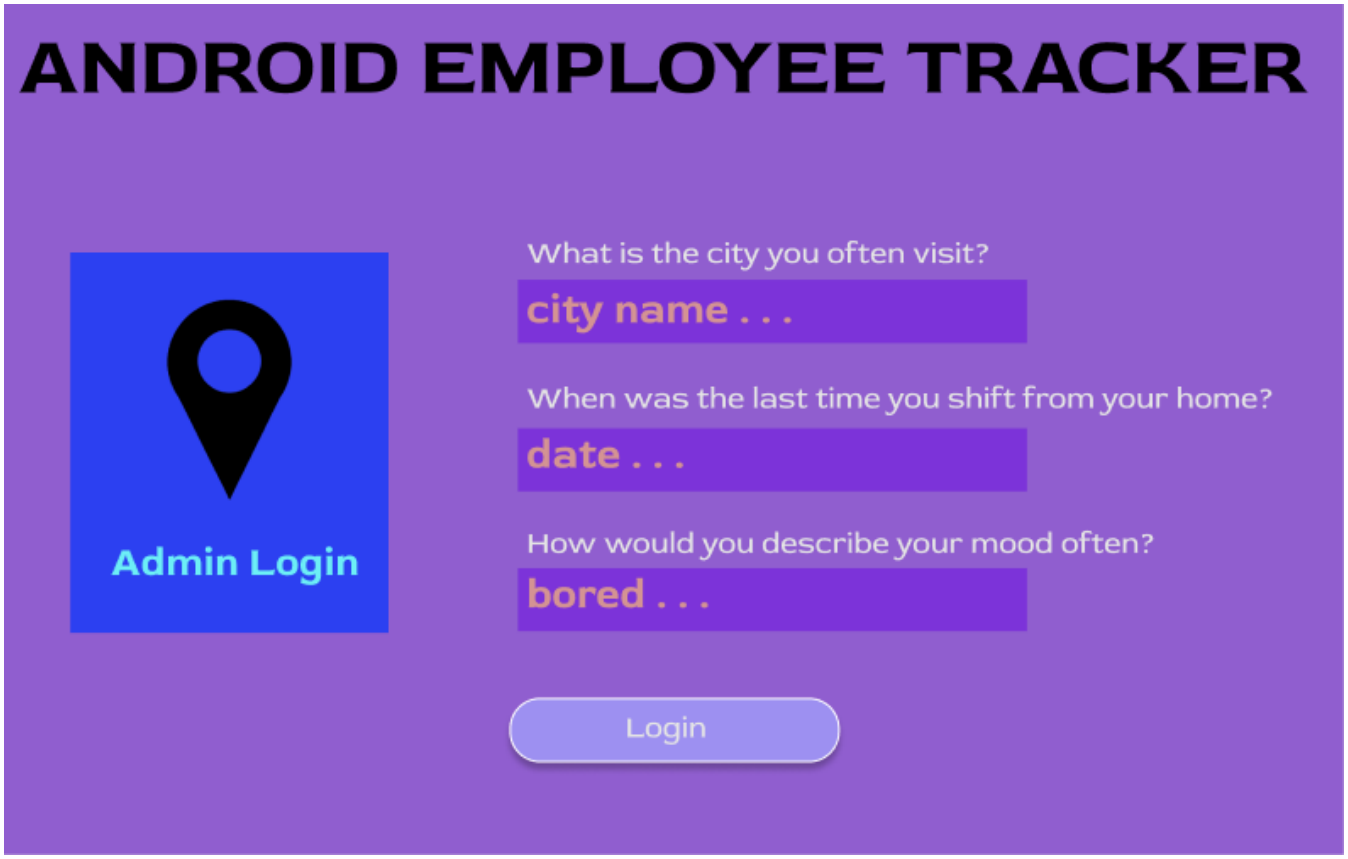
A prototype that reflects the concept for the Android Employee Tracker and the design of what the employees as well as admins will see on their devices

On the pc/Desktop, what the admin views on the screen:

a) Admin's interface:

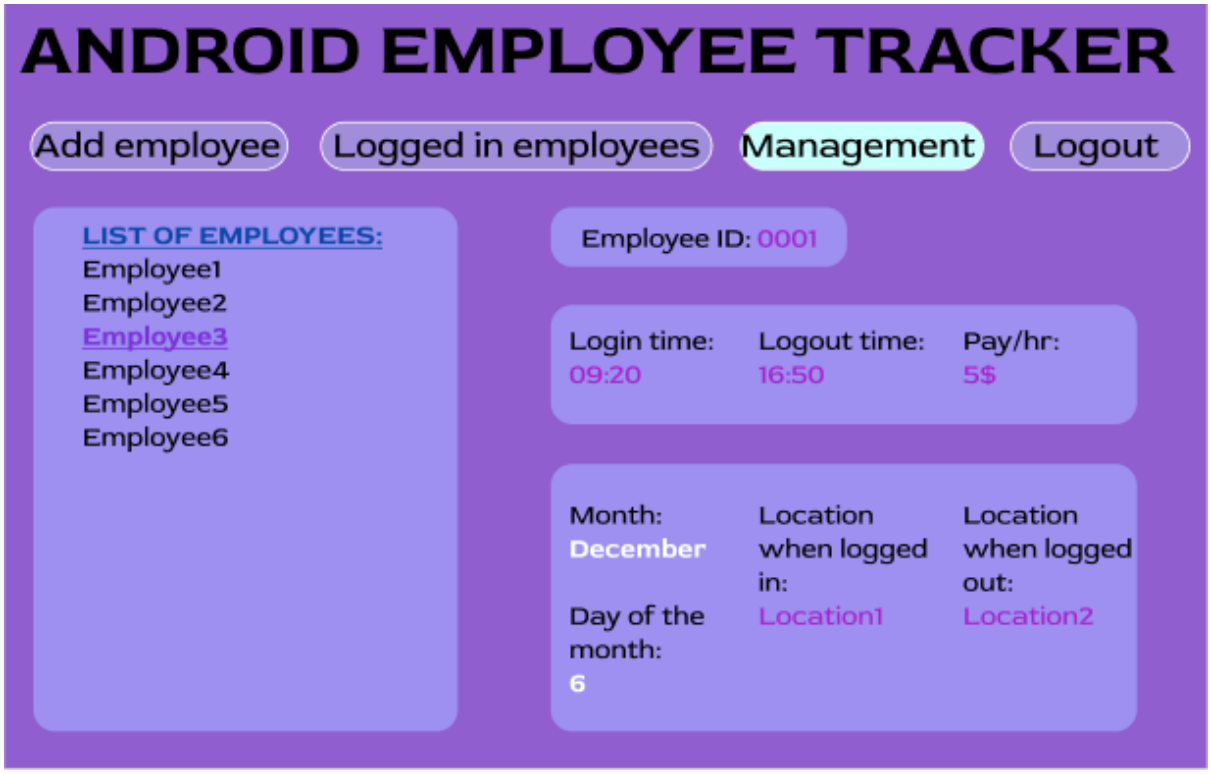


b) Admins second login page where it asks a series of security questions:



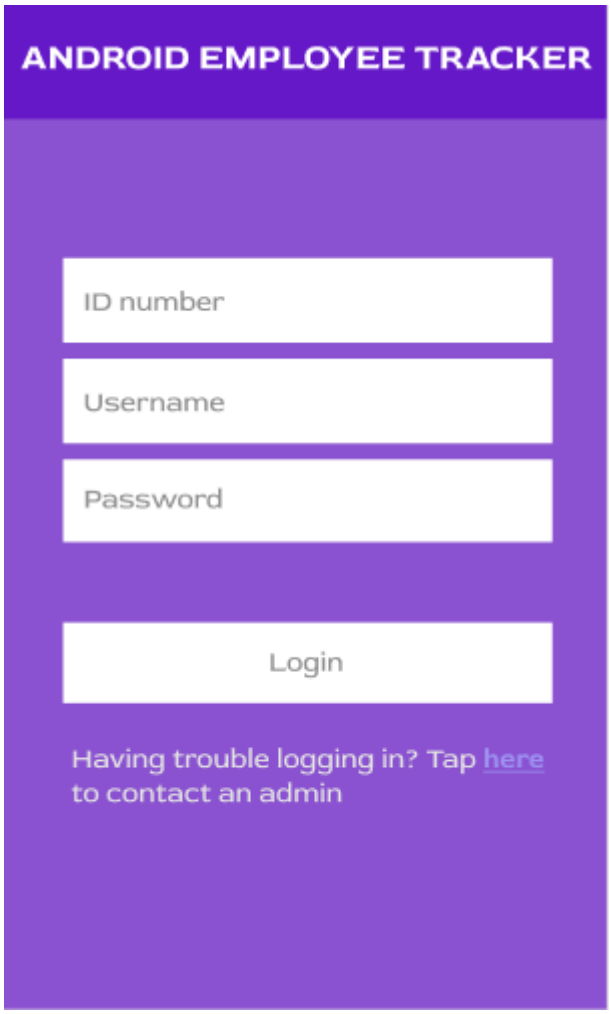
c) Admin's screen when checking the whereabouts of logged in employees:

d) Admin's screen when checking the history of the employee's whereabouts, worktime and hourly salary:



Moving on to the Employee, what the employee sees on their Android devices screen:

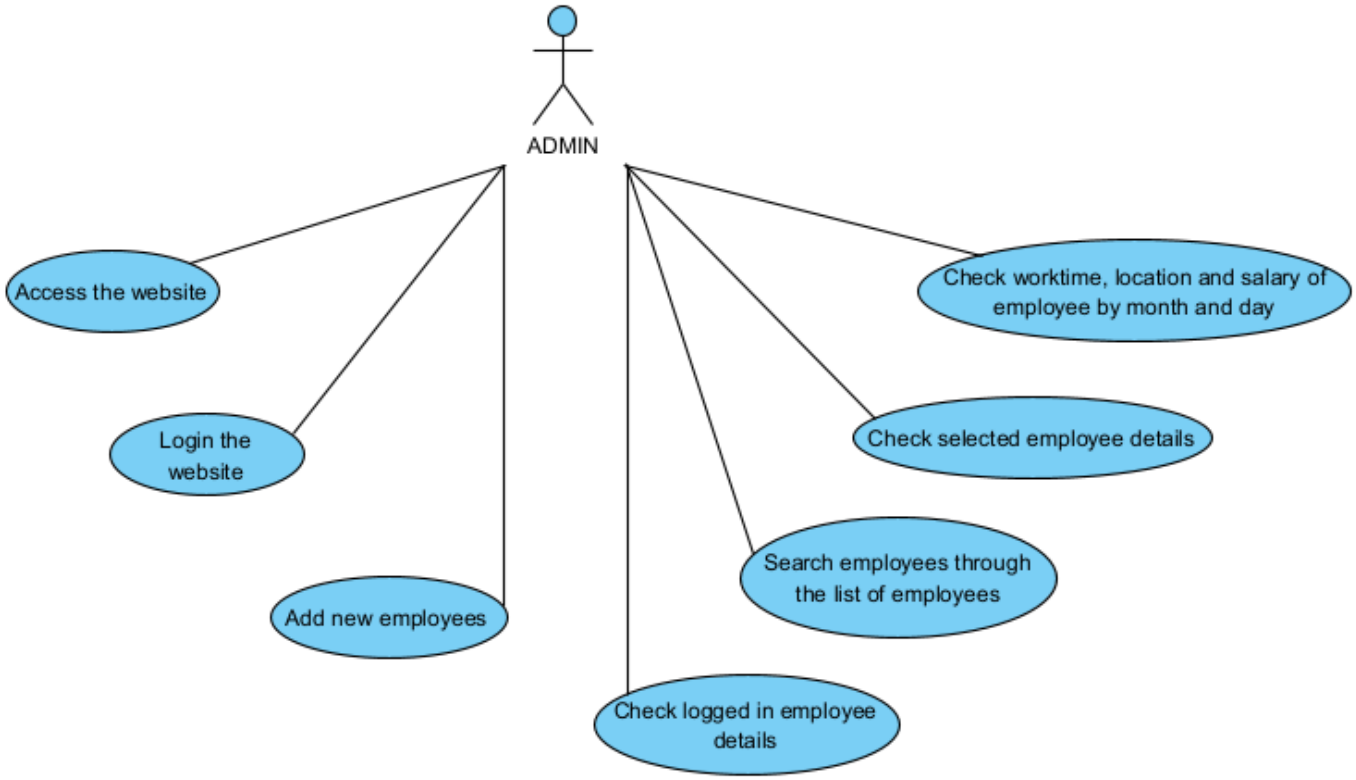
a) Employee's login screen:

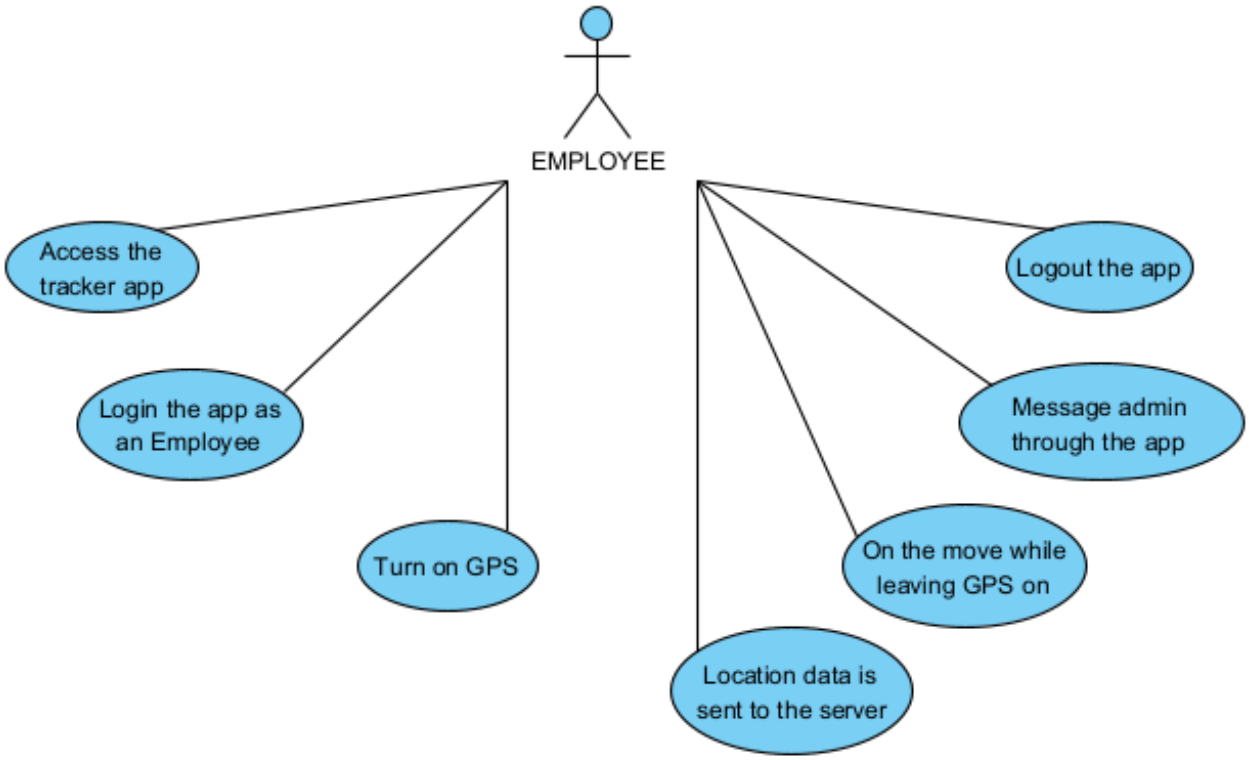


b) Employee's screen after logging in:

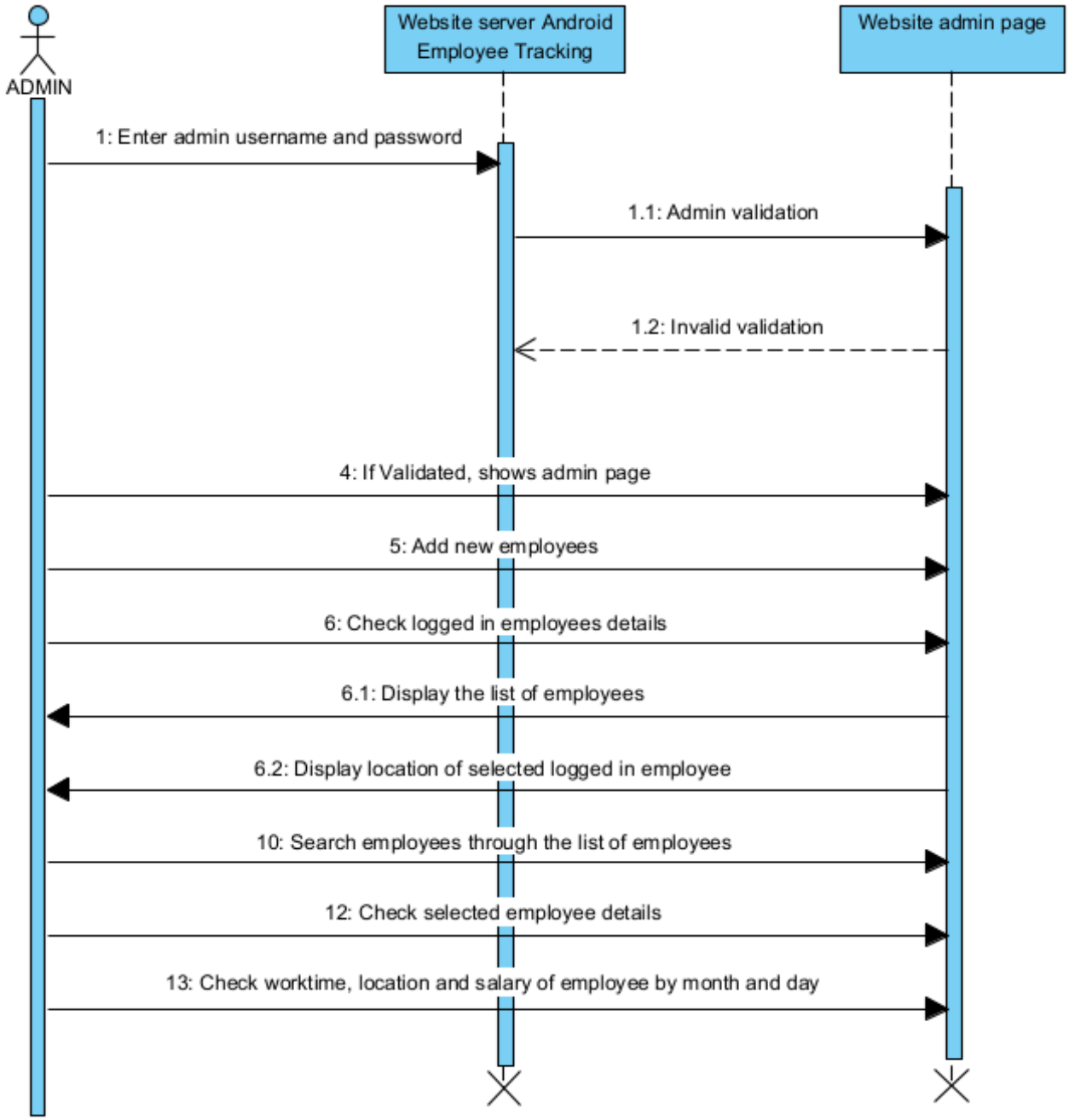
8.0 UML diagrams

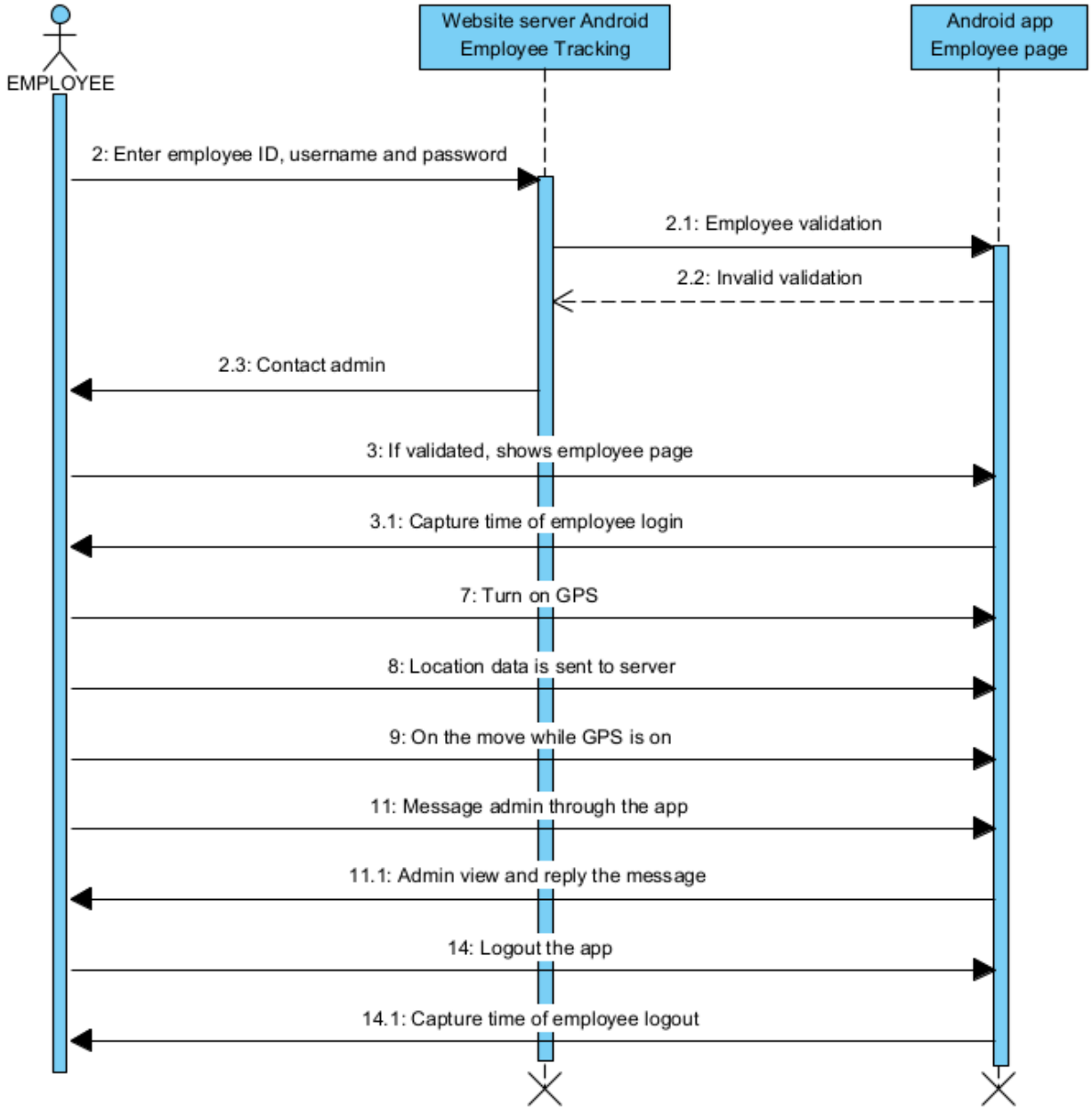
Use Case diagram:



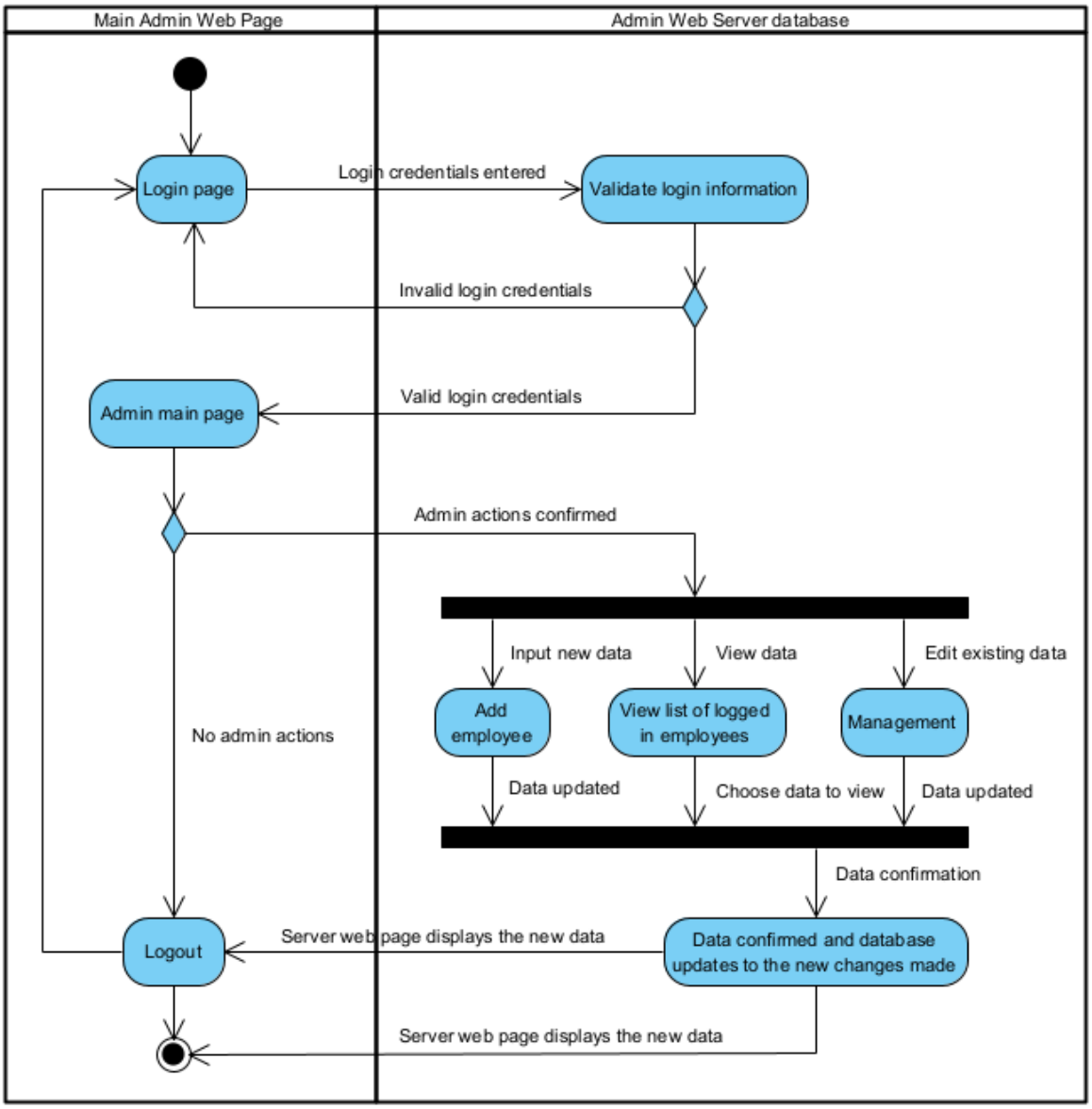


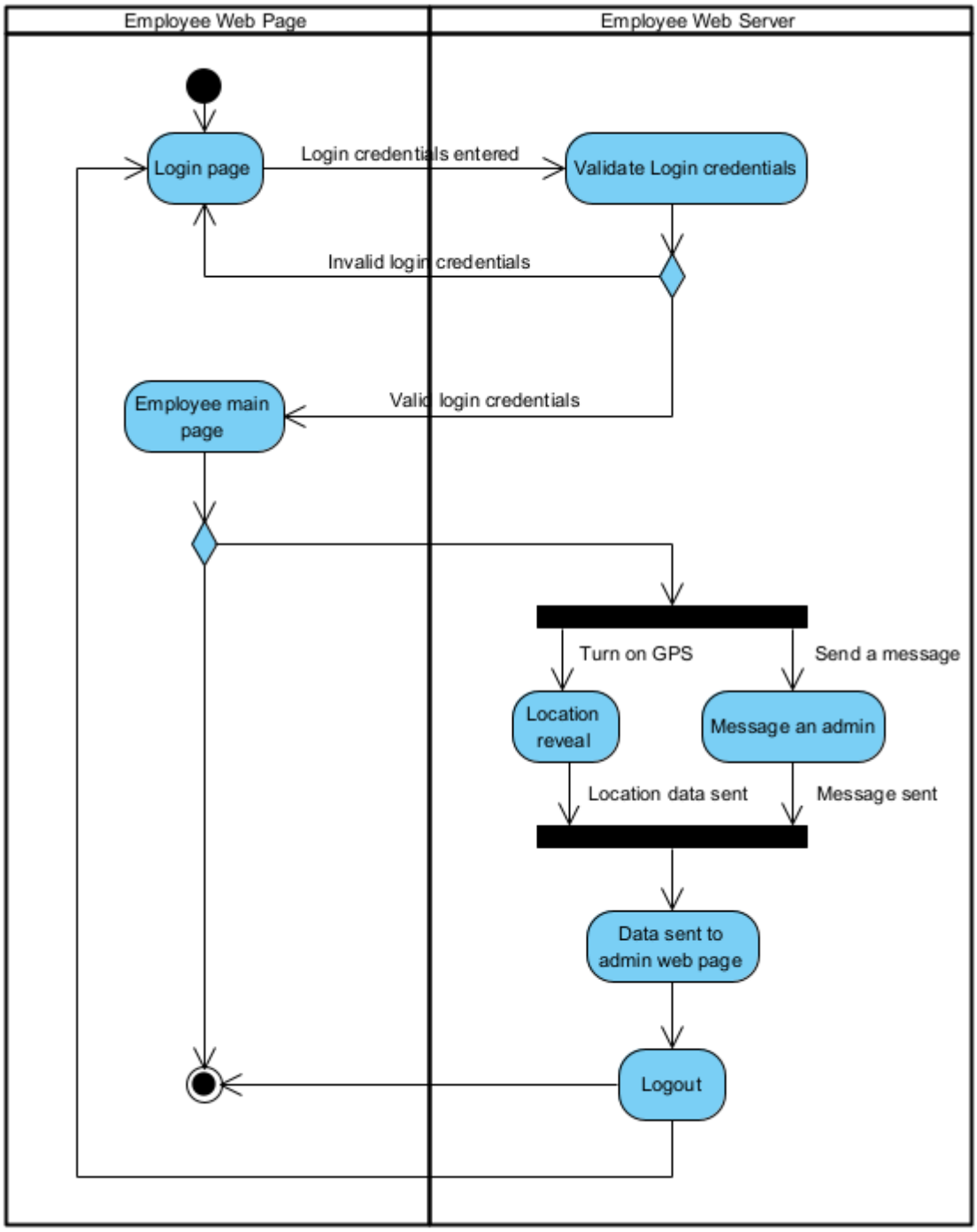
Sequence diagram:



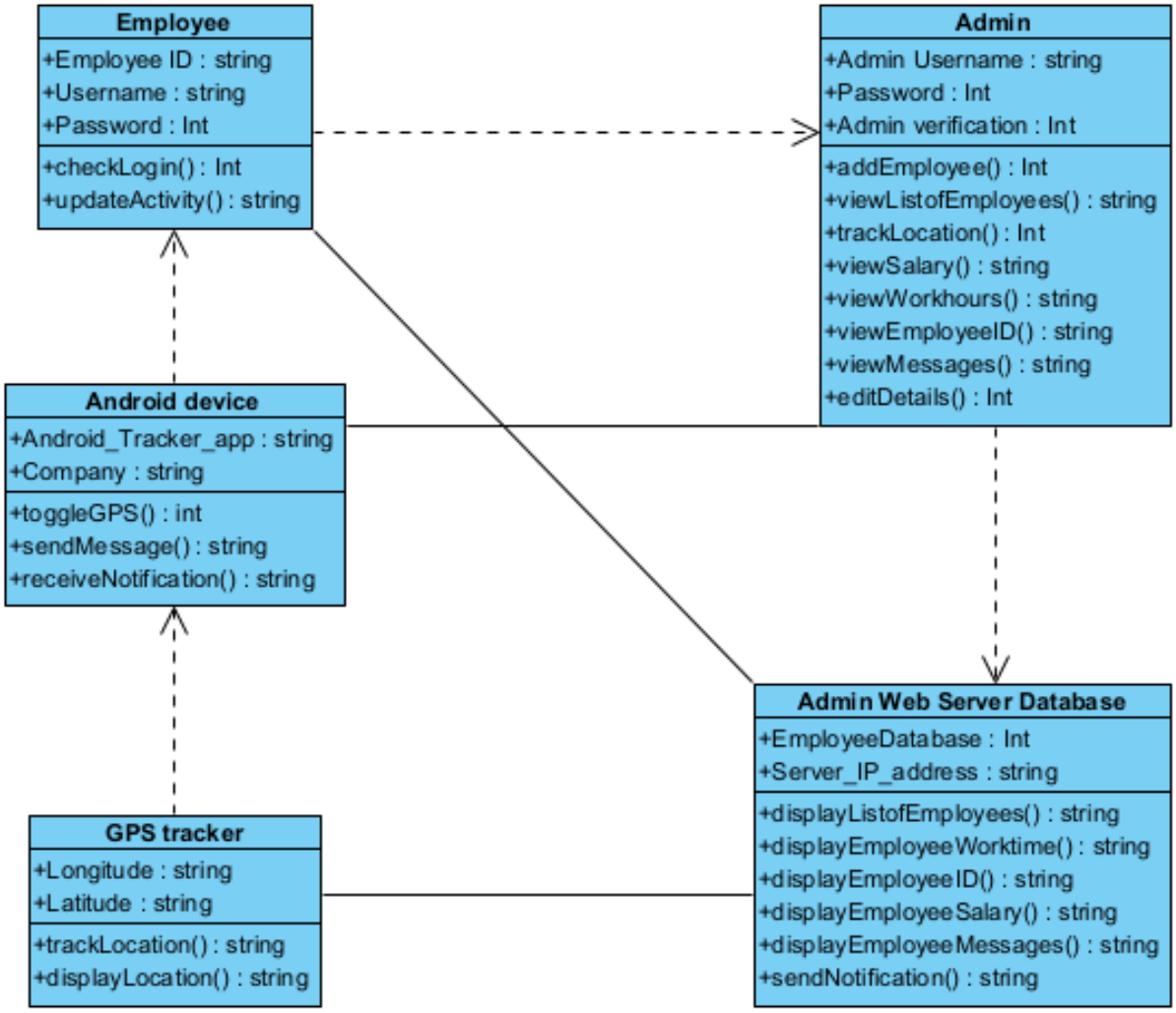

EMPLOYEE
Website server Android Employee Tracking
Android app Employee page
2: Enter employee ID, username and password
2.1: Employee validation
2.2: Invalid validation
2.3: Contact admin
3: If validated, shows employee page
3.1: Capture time of employee login
7: Turn on GPS
8: Location data is sent to server
9: On the move while GPS is on
11: Message admin through the app
11.1: Admin view and reply the message
14: Logout the app
14.1: Capture time of employee logout

Activity diagram:




Employee Web Page
Employee Web Server
Login page
Login credentials entered
Validate Login credentials
Invalid login credentials
Employee main page
Valid login credentials
Turn on GPS
Send a message
Location reveal
Message an admin
Location data sent
Message sent
Data sent to admin web page
Logout

Class diagram:



SE Project Report (100%)

Based on the system that has been assigned by your lecturer, review ways to improve the system from a conventional system to an improved prototype version of the system. The deliverable of the project will be a report which covers from Project Preliminary Stage to the Project Analysis and Design of the system. The report should include the system description, system functionality, prototype design and UML diagrams of the system. The following are the content outline of the report:

A) Project Preliminary Stage (30%)

Introduction:

A clear project description and an introduction of the relevant work related to your project.

Project Objectives and Project Scope:

Project objectives are what you plan to achieve by the end of your project. This might include deliverables and assets, or more intangible objectives like increasing productivity or motivation. Project scope is a detailed outline of all aspects of a project, including all related activities, resources, timelines, and deliverables, as well as the project's boundaries.

Software Process Model:

A software process model represents the order in which the activities of software development will be undertaken. It describes the sequence in which the phases of the software lifecycle will be performed. Justify a software process model that you will apply to develop the system.

B) Project Analysis and Design (30%)

Requirements Plan:

The Requirements Plan is a necessary tool for establishing how requirements will be collected, analyzed, documented, and managed throughout the lifecycle of a project. Identify the stakeholders with their role.

System Functionality:

To describe the system functionality of the system being developed, this will include the functional requirements and non-functional requirements. Justify why the functions are necessary for the system.

Prototype Design:

Prototypes can take many forms, such as simple sketches or storyboards used to illustrate a proposed experiential solution, or digital interfaces of the system.

C) UML Diagrams (40%)

You are required to draw four UML diagrams to define and visualise the system being developed by using Visual Paradigm software tools. The criteria of each diagram can refer to the marking rubrics attached. The UML diagrams are:

- Use case diagram
- Class diagram
- Sequence diagram
- Activity diagram

Criteria	Marks	Unsatisfactory <40%	Average 40-59%	Good 60-69%	Excellent 70+ %
A) <u>Project Preliminary Stage</u>	**30%**				
Introduction	0-10	Poorly introduce the project, the idea is not clear, and the information is irrelevant.	Introduce the project with some missing information, the outline is clear with some irrelevant information.	Introduce the project clearly, the idea is clear, but statements require improvement.	Introduce the project clearly, the idea is clear, and the statement is complete.
Project Objectives & Project Scope	0-10	Project objectives and project scope severely underdeveloped. Task unclear / confused.	Subject valid and relevant. Some shortcomings in clarity of purpose and associated objectives. Task definition could improve but clear & explicit.	Subject valid and relevant. Appropriate rationale. Task clear and explicit. Scope for study appropriate.	Clear statement of problem and associated objectives. Persuasive and comprehensive rationale.
Software Process Model	0-10	No justification for selected software process model. No understanding of methodology and implication.	Some justification and rationale for software process model. Reasonable methodology selected.	Appropriate selection of and justification for software process model. Appropriate methods used. More advanced understanding of limitations.	Correct selection of and justification for software process model. Full understanding of values and limitations of method.
B) <u>Project Analysis and Design</u>	**30%**				
Requirements Plan	0-10	No understanding of the requirements process plan.	Some understanding of the tasks and adequate coverage of the requirements plan.	Good knowledgeable of the requirements plan. Ample coverage of the subject matter in sufficient technical detail.	Excellent understanding and insight knowledge of the requirements plan. Comprehensive coverage of technical detail.
System Functionality	0-10	Weak and unacceptable analysis of system functionality.	Appropriate analysis, but limited critical awareness system functionality.	Competent analysis of system functionality.	High level analysis of system functionality. Critical competence.

Prototype Design	0-10	Poorly thought-out design. Design is inconsistent. Has issues with scaling or layout on different viewport sizes.	Adequately thought-out design. Design is somewhat consistent. With some issues with scaling or layout on different viewport sizes.	Well thought-out design. Design is mostly consistent. With one or two issues with scaling or layout on different viewport sizes.	Excellently thought-out design. Design is consistent. Has no issues with scaling or layout

C) <u>UML Diagrams</u>	**40%**				
Use Case Diagram	0-10	Use cases don't cover any of the desired features mentioned in the requirements document.	Use cases cover some of the desired features mentioned in the requirements document.	Use cases cover most of the desired features mentioned in the requirements document.	Use cases cover all the desired features mentioned in the requirements document.
Class Diagram	0-10	Class diagram shows no relationship between the various classes.	Some classes are in the diagram with missing methods, attributes and relationships.	All classes are mentioned in the diagram with their methods, attributes and relationships, but the layout and presentation are not organised.	All classes are mentioned in the diagram with their methods, attributes and relationships are well presented.
Sequence Diagram	0-10	Unclear and doesn't depict any scenario from the Use Cases.	Depicts a few scenarios properly using appropriate arrows but with a few flaws in notations.	Depicts most of the scenarios properly using appropriate arrows but with little to no flaws in notations.	Depicts all the scenarios from the Use Cases in a clear manner using appropriate arrows. All notations are correct and well presented.
Activity Diagram	0-10	Activity diagram doesn't show the flow of the action.	Activity diagram shows the procedural flow of most of the actions but doesn't clearly explain the business-level functions.	Activity diagram shows the procedural flow of all actions in an activity that explains the business-level functions but has minor flaws with the notations and presentation.	Activity diagram shows the procedural flow of all actions in an activity that explains the business-level functions in a clear manner. All notations are correct and well presented.
Overall Project Marks	100%	Additional comments by Examiners			

SEG2202: Software Engineering
(December 2021)