**PROJECT ASSIGNMENT**

**Course:** Software Design and Management  
**Title:** **Design and Implementation of an Employee Clocking System**

**1. Introduction**

Employee attendance tracking is a crucial aspect of workforce management. Traditional methods, such as manual registers, are prone to errors and inefficiencies. This project aims to design and implement a **digital employee clocking system** that ensures accurate time tracking, reduces fraud, and improves organizational efficiency.

**1.1 Project Objectives**

* To design and develop an **automated clocking system**.
* To implement **secure authentication methods** (biometric, RFID, or PIN).
* To provide **real-time attendance tracking** and reporting.
* To ensure **data security and access control**.

**1.2 Scope of the Project**

The system will:  
✔ Allow employees to clock in and out using **biometric, RFID, PIN, or mobile app**.  
✔ Store attendance records in a **database** for easy retrieval.  
✔ Provide **admin access** for monitoring attendance.  
✔ Generate **reports** for payroll and HR purposes.

**2. Software Development Life Cycle (SDLC) Approach**

The **Software Development Life Cycle (SDLC)** will be used to guide the development of this system. The **Agile** methodology will be adopted to ensure flexibility and continuous improvements.

**2.1 SDLC Phases**

**Phase 1: Planning and Requirement Analysis**

**Activities:**

* Identify user needs (HR, employees, and management).
* Define system requirements:
  + Functional: Employee authentication, attendance tracking, reporting.
  + Non-functional: Security, scalability, performance.
* Feasibility study (technical, operational, and financial).

**Deliverables:**

* **Project Proposal**
* **Requirement Specification Document**

**Phase 2: System Design**

**Activities:**

* **System Architecture**: Three-tier (Frontend, Backend, Database).
* **User Interface (UI) Design**: Web-based and mobile-friendly.
* **Database Design**: Tables for employees, attendance logs, and reports.

**Technologies Used:**

* **Frontend:** React.js, HTML/CSS, Bootstrap
* **Backend:** Node.js (Express) / Django (Python) / Laravel (PHP)
* **Database:** MySQL / PostgreSQL

**Deliverables:**

* **System Design Document**
* **ER Diagrams and Data Flow Diagrams**

**Phase 3: Implementation (Coding & Development)**

**Activities:**

* Develop **login and authentication module** (biometric, RFID, PIN).
* Implement **clock-in and clock-out logic**.
* Integrate **database for storing attendance records**.
* Develop **admin dashboard for monitoring attendance**.

**Deliverables:**

* **Source Code Repository** (GitHub, GitLab).
* **Working Prototype**.

**Phase 4: Testing**

**Types of Testing:**

* **Unit Testing:** Testing individual components (login, clocking function).
* **Integration Testing:** Ensuring all modules work together.
* **User Acceptance Testing (UAT):** Employees and HR test the system.

**Deliverables:**

* **Test Case Document**
* **Bug Report**

**Phase 5: Deployment & Maintenance**

**Activities:**

* Deploy the system on a **local server/cloud (AWS, Firebase, DigitalOcean)**.
* Train employees and HR personnel on usage.
* Provide **regular updates and maintenance**.

**Deliverables:**

* **Deployment Report**
* **User Manual**

**3. Expected Outcomes**

* A fully functional **Employee Clocking System**.
* Accurate and real-time **attendance tracking**.
* Enhanced **security and efficiency** in workforce management.