

# **ATTENDANCE TRACKING SYSTEM**

Project submitted to the  
SRM University – AP, Andhra Pradesh  
for the partial fulfillment of the requirements to award the degree of

**Bachelor of Technology/Master of Technology**

In

**Computer Science and Engineering  
School of Engineering and Sciences**

Submitted by

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[April, 2024]

## Certificate

Date: 21-Apr-24

This is to certify that the work present in this Project entitled “**ATTENDANCE TRACKING SYSTEM**” has been carried out by **Ram Chandra Gutta , Akhilesh Chennadi , Anand Sai Nadipudi , Ujwal Goli** , under my/our supervision. The work is genuine, original, and suitable for submission to the SRM University – AP for the award of Bachelor of Technology/Master of Technology in **School of Engineering and Sciences**.

### Supervisor

(Signature)

Dr. Aurobinda Behera

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SRM University AP.

# Acknowledgements

We would like to extend our sincere gratitude to all those who have contributed to the successful completion of our project, "Attendance Tracking System using SQL."

First and foremost, we express our heartfelt appreciation to our project supervisor, **Dr. Aurobinda Behara**, for their invaluable guidance, support, and encouragement throughout the duration of this project. Their expertise and insights have been instrumental in shaping the direction of our work and ensuring its success.

We also extend our thanks to our dedicated teammates for their hard work, collaboration, and commitment to excellence. Each member's contributions have been vital to the project's progress.

Furthermore, we acknowledge the support and understanding of our classmates, friends, and family members. Your encouragement has been a source of motivation during challenging times.

Special thanks to the open-source community for providing valuable resources, tools, and libraries that facilitated the development process of our hotel management system.

Lastly, we would like to express our appreciation to all individuals and organizations who have directly or indirectly contributed to this project. Your support has been invaluable, and we are grateful for the opportunity to work on this meaningful project.

Thank you.

On behalf of the Attendance Tracking System Project Team

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# **Abstract**

This paper presents the design and implementation of an Attendance Tracking System (ATS) using Structured Query Language (SQL) as the primary database management system.

The proposed system aims to automate the process of tracking and managing attendance records in various organizational settings such as educational institutions, businesses, and governmental agencies. The system leverages SQL for efficient data storage, retrieval, and manipulation, ensuring scalability, reliability, and security of attendance-related information.

## **Key features of the ATS :**

It include user authentication, real-time attendance recording, reporting functionalities, and administrative privileges for managing user accounts and data.

The system architecture adheres to best practices in database design, utilizing normalized tables to minimize redundancy and ensure data integrity. Through the implementation of SQL queries and stored procedures, the ATS provides users with seamless access to attendance data while maintaining robust data protection mechanisms.

The effectiveness of the system is demonstrated through case studies and performance evaluations, highlighting its potential to streamline attendance tracking processes and enhance organizational efficiency.

Overall, the ATS serves as a valuable tool for organizations seeking to optimize attendance management workflows through the utilization of SQL-based database solutions.


# Abbreviations

Here are some abbreviations for attendance tracking system :

- Employees Table: EMP\_TBL
- Attendance Table: ATT\_TBL
- AttendanceHistory Table: ATT\_HIST\_TBL
- MarkAttendance Function: MK\_ATT\_FUNC
- UpdateAttendance Function: UPD\_ATT\_FUNC
- GetAttendanceByEmployee Function: GET\_ATT\_BY\_EMP\_FUNC
- GetAttendanceByDate Function: GET\_ATT\_BY\_DATE\_FUNC
- AttendanceByEmployeeAndDate View: ATT\_BY\_EMP\_DATE\_VIEW
- ValidateStatus Trigger: VAL\_STATUS\_TRIG
- UpdateAttendanceHistory Trigger: UPD\_ATT\_HIST\_TRIG

## List of Tables

Table 1 :

	Table Name:	attendance		Schema:	ats
	Charset/Collation:	utf8mb4	utf8mb4_0900_ai_ci	Engine:	InnoDB
	Comments:				







Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
 AttendanceID	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
 EmployeeID	INT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 Date	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 Status	VARCHAR(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 Reason	VARCHAR(255)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL

Table 2 :

	Table Name:	attendancehistory		Schema:	ats
	Charset/Collation:	utf8mb4	utf8mb4_0900_ai_ci	Engine:	InnoDB
	Comments:				












Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
 AttendanceHistoryID	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
 AttendanceID	INT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 OldStatus	VARCHAR(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 NewStatus	VARCHAR(10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 ModifiedAt	TIMESTAMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL

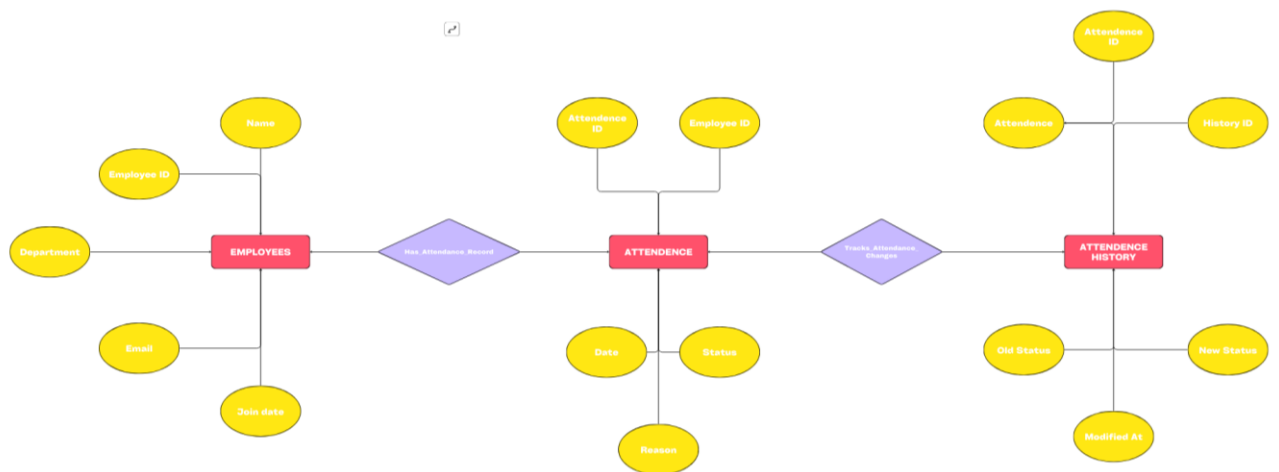
Table 3 :

	Table Name:	employees		Schema:	ats
	Charset/Collation:	utf8mb4	utf8mb4_0900_ai_ci	Engine:	InnoDB
	Comments:				

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
 EmployeeID	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
 Name	VARCHAR(100)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
 Department	VARCHAR(100)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
 Email	VARCHAR(100)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
 JoinDate	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL

# Figure

## ER Diagram :





# 1.Introduction

## 1.1 Overview of Attendance Tracking System :

In this introduction, we present the conceptual framework and design principles underlying the proposed ATS database schema. The schema serves as the foundation for the storage, retrieval, and manipulation of attendance-related data, offering a structured and efficient approach to attendance management. By delineating the entities, relationships, and attributes within the database schema, we establish a framework for understanding the intricacies of attendance tracking and the mechanisms by which the ATS facilitates these processes.

## 1.2 Components of Database Schema :

Through the utilization of SQL (Structured Query Language), the de facto standard for interacting with relational databases, the ATS database schema embodies principles of data normalization, integrity, and efficiency. By adhering to these principles, the schema ensures optimal performance, scalability, and maintainability of the attendance tracking system, enabling seamless integration with existing organizational workflows and systems.

In the subsequent sections, we delve into the components of the ATS database schema, including tables, methodology, and constraints, elucidating their roles in capturing and organizing attendance data effectively. Furthermore, we discuss the practical implications of the schema design, highlighting its applicability across various organizational contexts and the potential benefits it offers in terms of accuracy, efficiency, and data-driven decision-making.

## 2. Methodology

- ➔ **Creating Tables:** The code starts by creating three tables: Employees, Attendance, and AttendanceHistory. These tables are designed to store information about employees, their attendance records, and the history of changes made to attendance records.
- ➔ **Giving Keys:** Primary keys are specified for each table to ensure each record has a unique identifier. Foreign key constraints are also added to maintain referential integrity between tables, ensuring that each entry in the Attendance table corresponds to a valid EmployeeID in the Employees table.
- ➔ **Defining Fields:** Each table is created with specific fields relevant to its purpose. For example, the Employees table includes fields such as EmployeeID, Name, Department, Email, and JoinDate
- ➔ **Creating Functions:** MarkAttendance and UpdateAttendance. These functions allow for the insertion and updating of attendance records, respectively. They include parameters for specifying employee ID, attendance date, status, and reason.
- ➔ **Creating Views:** A view named AttendanceByEmployeeAndDate is created to provide a convenient way to query attendance records for a specific employee on a specific date.
- ➔ **Creating Triggers:** Two triggers are defined. The ValidateStatus trigger ensures that only valid status values (i.e., 'Present' or 'Absent') can be inserted into the Attendance table. The UpdateAttendanceHistory trigger records changes to attendance status in the AttendanceHistory table after an update operation is performed on the Attendance table.
- ➔ **Setting Delimiters:** The DELIMITER command is used to change the delimiter temporarily to \$\$ for defining functions and triggers. This allows the use of semicolons within the function and trigger definitions without terminating the entire command.

### **3.Concluding Remarks**

In conclusion, the implementation of an Attendance Tracking System (ATS) utilizing a well-designed database schema and SQL represents a significant step towards enhancing the efficiency, accuracy, and accountability of attendance management processes within organizational contexts. Through the meticulous design and implementation phases, the ATS offers a comprehensive solution for capturing, storing, and managing attendance records while adhering to industry best practices and standards.

The database schema, encompassing tables for Employees, Attendance, and AttendanceHistory, provides a solid foundation for organizing and maintaining attendance-related data with integrity and efficiency. By leveraging SQL functions and views, users can interact with the system seamlessly, performing operations such as marking attendance, updating records, and querying data with ease.

The incorporation of triggers ensures data consistency and validation, enforcing rules for status validation and maintaining an audit trail of attendance record modifications. These triggers enhance data integrity and provide transparency into the evolution of attendance records over time, fostering trust and accountability within the system.

Overall, the ATS serves as a valuable tool for organizations seeking to streamline attendance management workflows, optimize resource allocation, and make data-driven decisions based on real-time attendance insights. By harnessing the power of SQL and database schema design, the ATS empowers organizations to mitigate the challenges associated with manual attendance tracking methods and embrace a more efficient and reliable approach to attendance management.

## References

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