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# INTRODUCTION

Automatic face recognition (AFR) technologies have made many improvements in the changing world. Smart Attendance using Real-Time Face Recognition is a real-world solution which comes with day to day activities of handling student attendance system. Face recognition based attendance system is a process of recognizing the students face for taking attendance by using face biometrics based on high - definition monitor video and other information technology.

The concept of face recognition is to give a computer system the ability of finding and recognizing human faces fast and precisely in images or videos. Numerous algorithms and techniques have been developed for improving the performance of face recognition. Human brain can automatically and instantly detect and recognize multiple faces. But when it comes to computer, it is very difficult to do all the challenging tasks on the level of human brain. The face recognition is an integral part of biometrics. In biometrics, basic traits of human are matched to the existing data. Facial features are extracted and implemented through algorithms, which are efficient and some modifications are done to improve the existing algorithm models. Computers that detect and recognize faces could be applied to a wide variety of practical applications including criminal identification, security systems, identity verification etc.

# **SYSTEM STUDY**

# **SYSTEM STUDY**

## **EXISTING SYSTEM**

Existing systems are based on paper sheet, finger print, They are not efficient to handle complex systems

At present, attendance, making involves manual attendance on the paper sheet by teachers, but it is a very time-consuming process and chances of proxy are also an issue that arise in such type of attendance marking.

Attendance system based on finger print is not suit for now, due to covid pandemic we can't use finger print system. Coronavirus can spread easily to human from anywhere. If any infected human touches the biometric attendance system with his/her body, the biometric system will contain virus. After that who is using biometric system is suspected to be infected by coronavirus

## **PROPOSED SYSTEM**

Proposed system is an android and python based application. The system mainly includes a security concepts based on Face Recognition. All the students of the class must be registered by entering the required details and then their images will be captured and stored in the dataset. During each session, faces will be detected from the entry and compared with images present in the dataset. If match found, attendance will be marked for the respective student. At the start of each session, list of absentees will be reported to the respective parents and teachers.

## **FUNCTIONAL MODULES**

The face recognition system generally involves two stages:

- 1.Face Detection – where the input image is searched to find any face, then image processing cleans up the facial image for easier recognition.
- 2.Face Recognition – where the detected and processed face is compared to the database of known faces to decide who that person is.

# **SYSTEM ANALYSIS**

# SYSTEM ANALYSIS

A system is orderly grouping of interdependent components linked together according to a plan to achieve a specific objective. Analysis is a detail study of various operations performed by system and their relationship within and outside the system. During analysis data are collected on the available files, decision points and transaction handled by the present system.

System Analysis is concerned with analyzing, designing, implementing and evaluating information system in our organization .It is carried out to make the system more effective either by modification or by substantial redesign. In system analysis we identify the problem, study the alternative solution and select the most suitable solution, which meet the technical economic and social demands for analysis, various tools such as dataflow diagram, interviews on site observation, questionnaires etc are used. System analysis process is also called a life cycle methodology since it relates to four significant phases in life cycle of all information system. They are,

1. System Analysis / Study Phase.
2. System Design / Design phase.
3. System Development / Development Phase.
4. Testing and implementation / Operation Phase.

All activities associated with each life cycle phase must be performed managed and documented. So system analysis is the performance, management and documentation of the activities related to the four life cycle phases of a computer based system.

## PRELIMINARY INVESTIGATION

The main aim of preliminary analysis is to identify the problem. First, need for the new or the enhanced system is established. Only after the recognition of need, for the proposed system is done then further analysis is possible.

Once the initial investigation is done and the need for new or improved system is established, all possible alternate solutions are chalked out. All these systems are known as "candidate systems". All the candidate systems are then weighed and the best alternative of all these is selected as the solution system, which is termed as the "proposed system".

The proposed system is evaluated for its feasibility. Feasibility for a system means whether it is practical and beneficial to build that system. The system has been designed in such a way that it can be modified with very little effort when such a need arises in the future. The system has been found to work efficiently and effectively. The administrator controls the entire system. He can add new user and update the users.

## **FEASIBILITY ANALYSIS**

Feasibility is a test of system according to workability, impact on organization ability to meet user needs, and effective use of resources. Following are the feasibility study employed,

1. Technical Feasibility
2. Operational Feasibility
3. Economical Feasibility

## **TECHNICAL FEASIBILITY**

Technical Feasibility is frequently the most difficult area to achieve at the stage of product engineering process. Considering that are normally associated with the technical feasibility include,

- Development risk
- Resource availability
- Technology

Technical Feasibility study deals with the hardware as well as software requirements. The scope was whether the work for the project is done with the current requirements and existing software technology has to be examined in the feasibility study. The outcome was found to be positive. In the proposed system, data can be easily stored and managed using database management system software. The reports and results for various queries can be generated easily. Therefore, the system is technically feasible.



## **OPERATIONAL FEASIBILITY**

Proposed projects are beneficial only if they can be turned into information system that will meet the organization's operating requirements. Simply stated, this test of feasibility asks if the system will work when it is developed and installed. Are there any major barriers to implementation? The purpose of the operational feasibility study is to determine whether the new system will be used if it is developed and implemented from users that will undermine the possible application benefits.

There was no difficulty in implementing the system and the proposed system is so effective, user friendly and functionally reliable so that the users in the company will find that the new system reduce their hard steps. If the user of the system is fully aware of the internal working of the system then the users will not be facing any problem in running the system.

## **ECONOMIC FEASIBILITY**

Proposed system was developed with the available resources. Since cost input for the software is almost nil the output of the software is always a profit. Hence software is economically feasible. In the existing system, manpower is more required. In the proposed system, number of employees to be involved is reduced drastically. So, the proposed system is said to be economic. In the existing system, storage of the records should be properly done and security should be provided for the records. In the proposed system, the software provides security and maintenance and it hardly needs one or two persons to operate the system.

## **REQUIREMENT ANALYSIS**

The process of gathering and interpreting facts, diagnosing problem and using the information to recommend improvements is called Requirement analysis. Fact finding techniques are used to collect data about requirements.

- Interview
- Questionnaires
- Record review
- Observation

## **DETERMINATION OF SYSTEM REQUIREMENTS**

The various points to be considered are:

- What is being done?
- How it is done?
- How frequently does it occur?
- How great is the volume of transaction?
- How well is the task performed?
- Does a problem exist?
- If a problem exists how serious is it?
- What is the underlying cause of the problem?

Requirement analysis mainly deals with the study of the existing system to know how it works and where improvements should be made. The analyst should have good Knowledge of the existing system and experience. Requirement analysis is used for Study and documentation of the current system. It helps the analyst to investigate the areas that would be otherwise been over looked.

## **REQUIREMENT SPECIFICATION**

The data produced during the fact-finding technique are analyzed to determine requirements specification. It involves three parts. They are:

- Analysis of factual data
- Identification of essential requirements
- Selection of requirements fulfilment strategies

## **DESIGN OF INPUT REQUIREMENTS**

It depends on the following factors:

- What data are to be inputted?
- What medium to be used?
- How is it assigned?

## **DESIGN OF PROCESSING REQUIREMENTS**

The processing requirements depend on the following factors:

- Development time
- Development cost
- Design acceptability

## **DESIGN OF OUTPUT REQUIREMENTS**

It includes the following:

- What is to be outputted?
- How to display present?
- What is the accepted format?

## **PROBLEM RECOGNITION**

Before a project has been planned, its objective and scope should be established, alternate solution should be considered and technical and management constraints should be identified. Without this information, it is impossible to decide reasonable and accurate estimate of cost, an effective assessment of risk realistic break down of task; or a manageable schedule that provides a meaningful indication of progress. The software developer and the customer must meet to define project objectives and scope. In many cases this activity begins as a part of the system engineering process and continues as first step in software requirement analysis. Objectives identify the overall goals of the project without considering how these goals will be achieved. Scopes identify the primary data, function and behaviors that characterize the problem and more important, attempts to bind these characteristics in a quantitative manner. Once the project objective and scope understood alternative solutions are considered.

Our aim here is to develop an efficient and improved geographical asset tracking solution and conserve valuable mobile resources by dynamically adapting the tracking scheme by means of context-aware personalized route learning techniques. This system uses Android based mobile phones for the software to be run.

## **PROBLEM EVALUATION AND SYNTHESIS**

An effective software project manager can diagnose the technical and organizational issues that are most relevant, systematically structure a solution or properly motivate other practitioners to develop the situation, apply lessons learned from last projects to new situations, and remain flexible enough to change direction of initial attempts at problem solution are fruitless. Problem decomposition, sometimes called partitioning is an activity that sits at the core of software requirement analysis.

During the scooping activity there are no attempts to fully decompose the problem. Rather decomposition is applied to two major areas. Functionally that must be delivered and the process that must be used to deliver it. Software functions, described in the statement of scope are evaluated and refined to provide more details prior to the beginning of estimation. Because both cost and schedule are functionally oriented, some degree of decomposition is often useful.

## **HARDWARE & SOFTWARE SPECIFICATION**

### **HARDWARE SPECIFICATION**

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.

Processor	: Intel Pentium and above
Primary Memory	: 4GB RAM
Storage	: 40 GB hard disk and above
Display	: VGA Color Monitor
Key Board	: Windows compatible
Mouse	: Windows compatible

## SOFTWARE SPECIFICATION

One of the most difficult task is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements. The application requirement:

Operating System	:	Windows 10
Front End	:	Python
Back End	:	SQLite
Frame work	:	Django
IDE	:	PyCharm
Web Browser	:	Internet Explorer/Google Chrome/Operamini

## TECHNOLOGIES

Coding	:	Python
Design	:	CSS
Database Server	:	SQLite

## SOFTWARE DESCRIPTION

### Python(Front end)

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.

Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.

Often, programmers fall in love with Python because of the increased productivity it provides. Since there is no compilation step, the edit-test-debug cycle is incredibly fast. Debugging Python programs is easy: a bug or bad input will never cause a segmentation fault. Instead, when the interpreter discovers an error, it raises an exception. When the program doesn't catch the exception, the interpreter prints a stack trace. A source level debugger allows inspection of local and global variables, evaluation of arbitrary expressions, setting breakpoints, stepping through the code a line at a time, and so on. The debugger is written in Python itself, testifying to Python's introspective power. On the other hand, often the quickest way to debug a program is to add a few print statements to the source: the fast edit-test-debug cycle makes this simple approach very effective.

Python's features include :

- **Easy-to-learn** – Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.
- **Easy-to-read** – Python code is more clearly defined and visible to the eyes.
- **Easy-to-maintain** – Python's source code is fairly easy-to-maintain.
- **A broad standard library** – Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.
- **Interactive Mode** – Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
- **Portable** – Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
- **Extendable** – You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- **Databases** – Python provides interfaces to all major commercial databases.
- **GUI Programming** – Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.
- **Scalable** – Python provides a better structure and support for large programs than shell scripting.

## **Django(Frame work)**

Django is a web application framework written in Python programming language. It is based on MVT (Model View Template) design pattern. The Django is very demanding due to its rapid development feature. It takes less time to build application after collecting client requirement.

This framework uses a famous tag line: The web framework for perfectionists with deadlines. By using Django, we can build web applications in very less time. Django is designed in such a manner that it handles much of configure things automatically, so we can focus on application development only.

Features of Django includes the following:

- Rapid Development
- Secure
- Scalable
- Fully loaded
- Versatile
- Open Source
- Vast and Supported Community

Django mainly follows MVT(Model View Template) architecture. The MVT (Model View Template) is a software design pattern. It is a collection of three important components Model View and Template. The Model helps to handle database. It is a data access layer which handles the data.

## **PyCharm**

**PyCharm** is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems (VCSes), and supports web development with Django as well as data science with Anaconda.

PyCharm is cross-platform, with Windows, macOS and Linux versions. The Community Edition is released under the Apache License, and there is also Professional Edition with extra features – released under a proprietary license.

## **Features of PyCharm**

Besides, a developer will find PyCharm comfortable to work with because of the features mentioned below –

- **Code Completion**

PyCharm enables smoother code completion whether it is for built in or for an external package.

- **SQLAlchemy as Debugger**

You can set a breakpoint, pause in the debugger and can see the SQL representation of the user expression for SQL Language code.

- **Git Visualization in Editor**

When coding in Python, queries are normal for a developer. You can check the last commit easily in PyCharm as it has the blue sections that can define the difference between the last commit and the current one.

- **Code Coverage in Editor**

You can run .py files outside PyCharm Editor as well marking it as code coverage details elsewhere in the project tree, in the summary section etc.

- **Package Management**

All the installed packages are displayed with proper visual representation. This includes list of installed packages and the ability to search and add new packages.

- **Local History**

Local History is always keeping track of the changes in a way that complements like Git. Local history in PyCharm gives complete details of what is needed to rollback and what is to be added.



- **Refactoring**

Refactoring is the process of renaming one or more files at a time and PyCharm includes various shortcuts for a smooth refactoring process.

- **User Interface of PyCharm Editor**

The user interface of PyCharm editor is shown in the screenshot given below. Observe that the editor includes various features to create a new project or import from an existing project.

## **Windows 10**

Windows 10 is a Microsoft operating system for personal computers, tablets, embedded devices and internet of things devices. Windows 10 is the most recent version of the operating system from Microsoft. Officially it was released in 2015 and was initially offered free of charge to legitimate users of Windows 7 and Windows 8.1. This new version combines features from those two previous installments to suit the users in a better way for both desktop/laptop computers as well as mobile devices. The familiar Start Menu, which Microsoft replaced with Live Tiles in Windows 8, returned in Windows 10. Users can still access Live Tiles and the touch-centric Metro interface from a panel on the right side of the Start Menu, however. Microsoft Windows 10 Continuum allows users to toggle between touchscreen and keyboard interfaces on devices that offer both. Continuum automatically detects the presence of a keyboard and orients the interface to match. Windows 10's integrated search feature allows users to search all local locations, as well as the web simultaneously.

Windows 10 received mostly positive reviews upon its original release. Critics praised Microsoft's decision to provide a desktop-oriented interface in line with previous versions of Windows, contrasting the tablet-oriented approach of Windows 8, although Windows 10's touch-oriented user interface mode was criticized for containing regressions upon the touch-oriented interface of its predecessor. Critics also praised the improvements to Windows 10's bundled software over Windows 8.1, Xbox Live integration, as well as the functionality and capabilities of the Cortana personal assistant and the replacement of Internet Explorer with Microsoft Edge. However, media outlets have been critical of the changes to operating system behaviors, including mandatory update installation, privacy concerns over data collection performed by the OS for Microsoft and its partners, and adware-esque tactics used to promote the operating system on its release.

## **SQLite(Back end)**

SQLite is a software library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. SQLite is one of the fastest-growing database engines around, but that's growth in terms of popularity, not anything to do with its size. The source code for SQLite is in the public domain.

SQLite is a software library that provides a relational database management system. The lite in SQLite means lightweight in terms of setup, database administration, and required resources.. It is a database, which is zero-configured, which means like other databases you do not need to configure it in your system. SQLite engine is not a standalone process like other databases, you can link it statically or dynamically as per your requirement with your application. SQLite accesses its storage files directly.

### **Why SQLite?**

- SQLite does not require a separate server process or system to operate (serverless).
- SQLite comes with zero-configuration, which means no setup or administration needed.
- A complete SQLite database is stored in a single cross-platform disk file.
- SQLite is very small and light weight, less than 400KiB fully configured or less than 250KiB with optional features omitted.
- SQLite is self-contained, which means no external dependencies.
- SQLite transactions are fully ACID-compliant, allowing safe access from multiple processes or threads.
- SQLite supports most of the query language features found in SQL92 (SQL2) standard.
- SQLite is written in ANSI-C and provides simple and easy-to-use API.
- SQLite is available on UNIX (Linux, Mac OS-X, Android, iOS) and Windows (Win32, WinCE, WinRT).

# **SYSTEM DESIGN**

# SYSTEM DESIGN

System Design involves translating system requirements and conceptual design into technical specification and general flow of processing. After the system requirements have been identified, information has been gathered to verify the problems and after evaluating the existing system a new system is proposed. System Design is the process of planning of new system or to replace or complement an existing system. It must be thoroughly understood about the old system determine how computers can be used to make its operations more effective. System Design sits at technical the kernel of the system development. Once system requirements have been analyzed and specified system design is the first of the technical activities – design, code generation and test that required to build and verify the software. System Design is the most creative and challenging phases of the system life cycle. The term design describes the final system and the process by which it is to be developed.

System Design is the high level strategy for solving the problem and building a solution. System Design includes decisions about the organization of the system into subsystems, the allocation of subsystems to hardware and software components and major conceptual and policy decision that forms the framework for detailed design.

There are two levels of system design:

- Logical design.
- Physical design.

In logical design, the designer produces a specification of the major features of the system which meets the objectives. The delivered product of logical design includes current requirements of the following system components:

- Input design.
- Output design.
- Database design.

Physical Design takes this logical design blue print and produces the program software, files and a working system. Design specifications instruct programmers about what the system should do. The programmers in turn write the programs that accept input from users, process data, process reports and store data in files.

Structured design in data flow based methodology that partitions a program into a hierarchy of modules organized top-down manner with details at the bottom. Data flow diagrams are the central tool and the basis from which other components are developed. The transformation of data from input to output, through process may be described logically and independently of the physical components.

## **MODULES OF THE PROJECTS**

- 1. Admin**
- 2. Teachers**
- 3. Student**
- 4. Parent**

### Admin

1. Login
2. Teacher Management (Add ,View, Delete, Edit)
3. Student Management(Add, View, Delete, Edit)
4. Department Management(add, View, delete, Edit)
5. View Teachers leave
6. View Student leave and late
7. View Feedback of Teachers From Student
8. View Complaint and replay
9. Approve leave for Teacher
10. Logout

### Teacher

1. Login
2. View Profile
3. View Students
4. View Student leave and late info
5. Sent complaint and view reply

6. Apply for leave and view status
7. Approve student leaves
8. Add attendance
9. Logout

#### Student

1. Login
2. View Profile
3. Apply for leave and view status
4. View attendance
5. Sent Complaint ,View reply
6. Sent feedback of Teachers
7. Logout

#### Parent

1. Registration
2. Login
3. View students late notifications
4. View Students leave notifications
5. View student attendance
6. Sent Complaints and View Complaint replies
7. Logout

### **MODELING**

Analysis model help to understand the relationship between different components in the system design, analysis model shows user more clearly, how a system will function. This is the first technical representation of a system. The analysis modelling must achieve three primary objectives:

- To establish a basis for creation of software design.
- To describe what the user requires.
- To define a set of requirements that can be validated once the software is built.

## **INPUT/OUTPUT DESIGN**

### **INPUT DESIGN**

Input Design is the process of converting the user-oriented inputs to a computer based format. The goal of designing input data is to make the automation is easy and free from errors. The design of handling input specifies how data are accepted for computer processing. Input design is art of overall system design that needs careful attention and if includes specifying the means by which actions are taken. A system user interacting through a work station must be able to tell the system whether to accept input produce a report or end processing.

The major objective of the input design is to make the data entry easier, logical and error free. With this objective the screen for the system are developed. The input design requirement such user friendliness, consistent format and interactive dialogue boxes for giving the right message and help for the user at the right time are also considered for the development of the project. The data entry operator need to know the space allocated for each field, the field sequence, which must match with source document and the format in which the data is entered.

### **OUTPUT DESIGN**

A quality output is the one, which meets the requirement of the end user and presents the information clearly .In any system, the results of processing are given to the users through the outputs. In the output design it is determined how the information is to be displayed for immediate need. Output design should improve the relationship of the system with user and help in decision making. The objective of the output design is to define the format of all printed documents and of the screens that will be produced by the system. The objective of the output design is to define the format of all printed documents and of the screens that will be produced by the system. The output has been designed as per the needs of the institution. The suggestions of the users are also taken into consideration while designing the layouts and the fields that are to be included in the project.

## DATA FLOW DIAGRAM

Data flow diagram is used to define the flow of the system and its resources such as information. Data flow diagrams are a way of expressing system requirements in a graphical manner. Data flow diagrams represent one of the most ingenious tools used for structured analysis. A Data flow diagram or DFD as it is shortly called is also known as a bubble chart. It has the purpose of clarifying system requirements and identifying major transformations that will become programs in system design. It is the major starting point in the design phase that functionally decomposes the requirement specifications down to the lowest level of details.

A data flow diagram consists of a series of bubbles joined by lines. The bubble represents data transformation and lines represent flow in the system. In the normal convention, a Data flow diagram has four major symbols.

1. Square, which defines source or destination of data



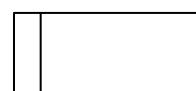
2. Arrow, which shows data flow



3. Circle, which represent a process that transforms incoming data into outgoing flow



4. Open rectangle, which shows data store

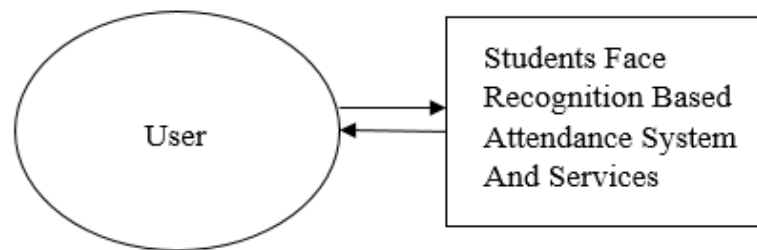


The Data flow diagram at the simplest level is referred in simple words a —CONTEXT ANALYSIS DIAGRAM. These are expanded by level, each explaining its process in detail. Processes are numbered for easy identification and are normally labelled in block letters. Each data flow is labelled for easy understanding.

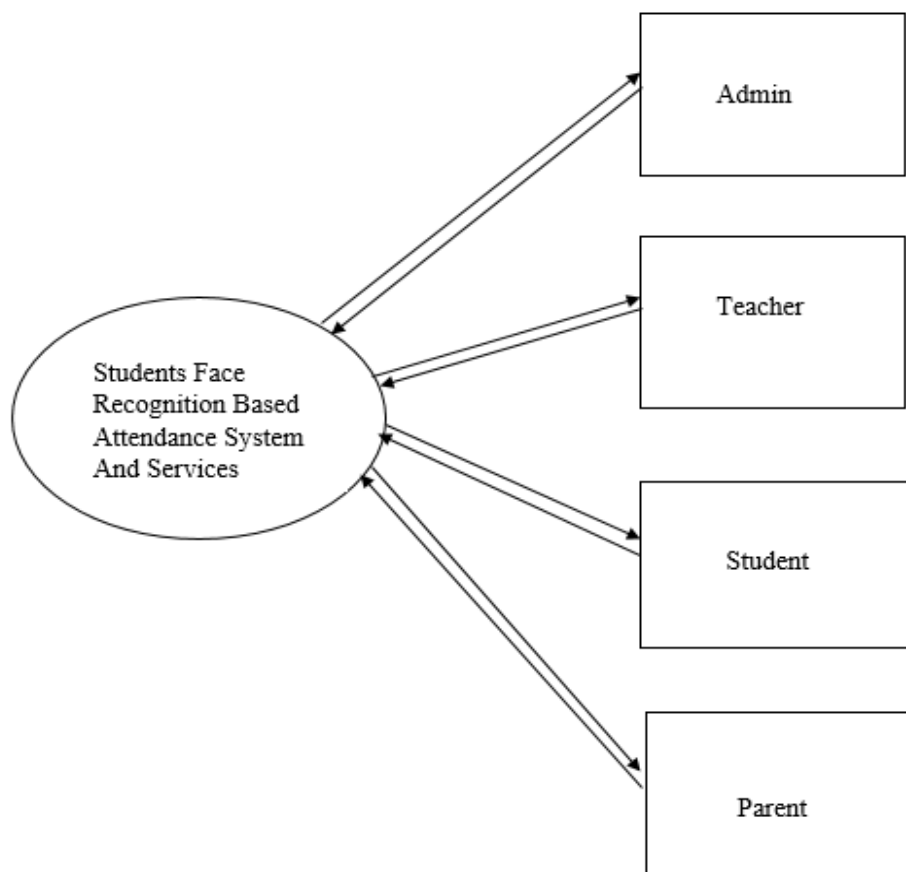


## DFD

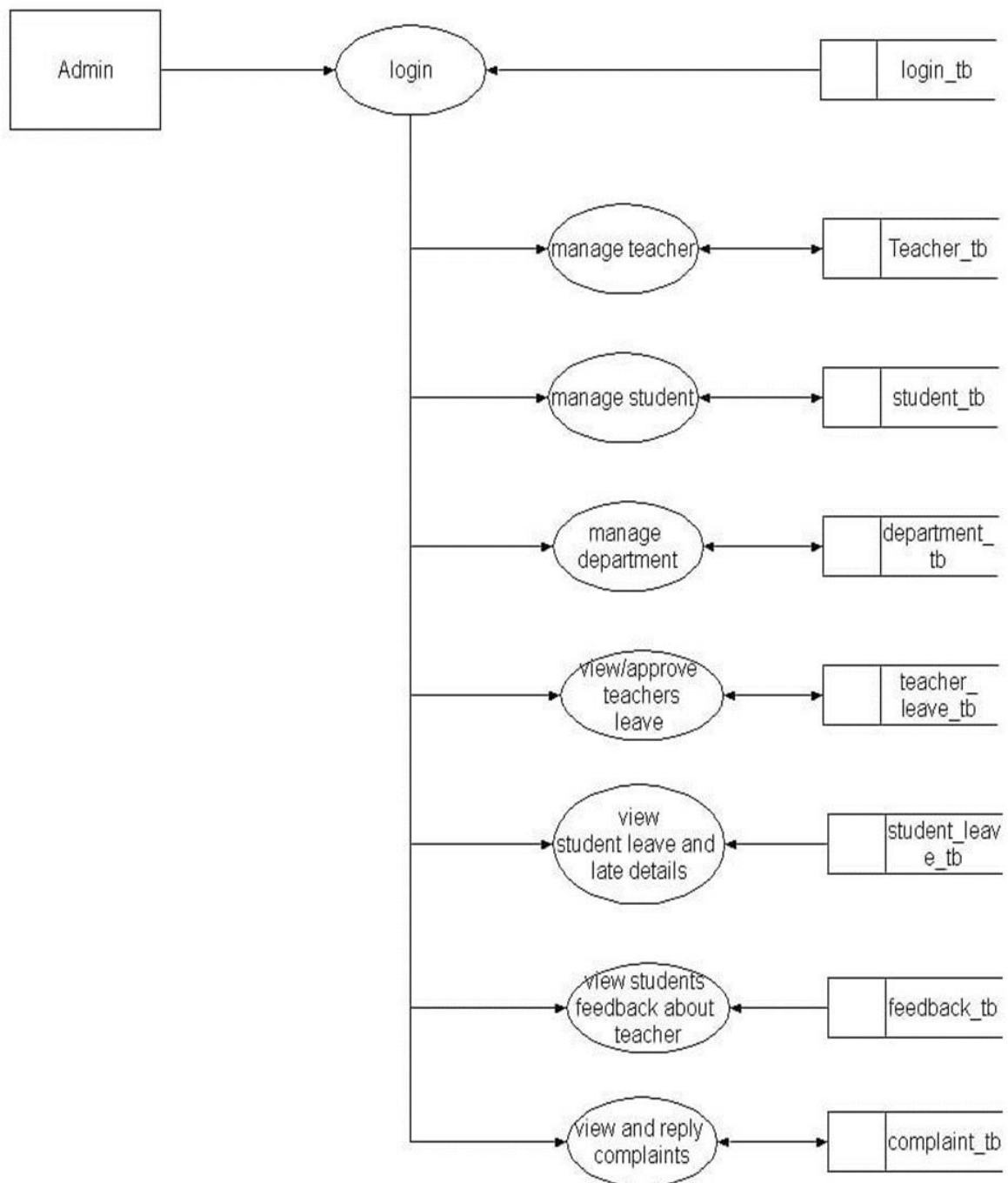
### Level 0 DFD(Context Diagram)



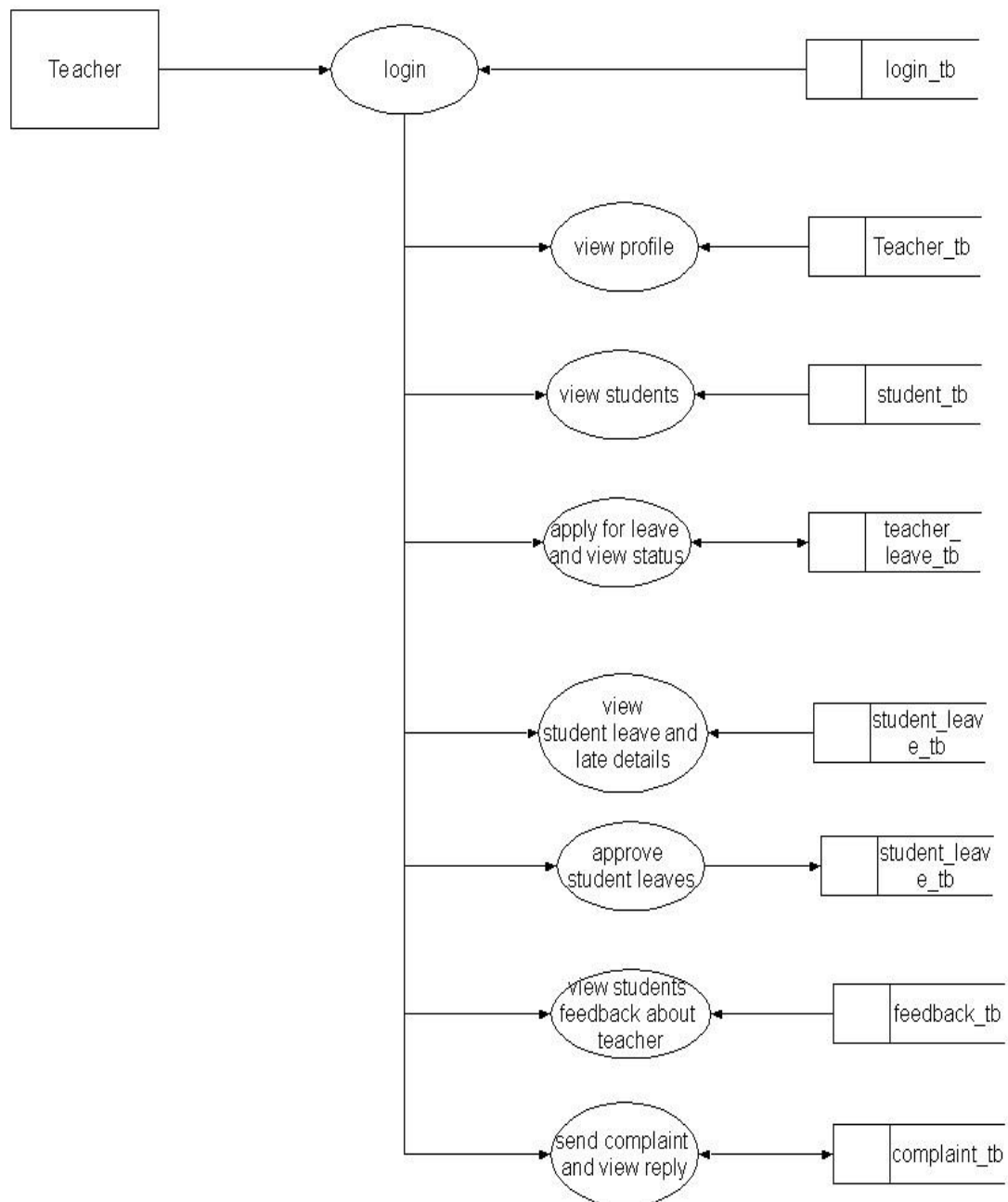
### Level 1 DFD



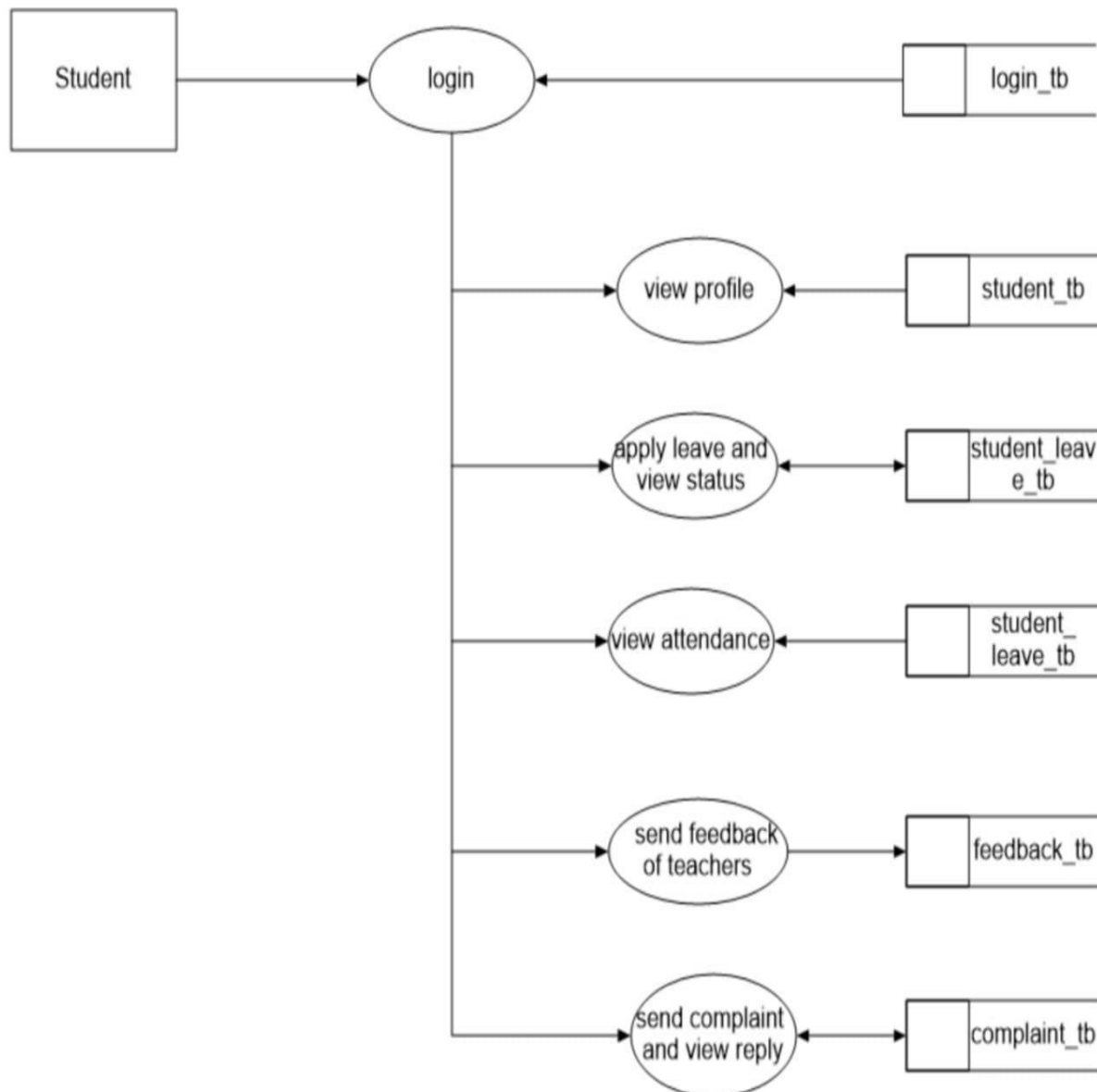
### Level 1.1 DFD



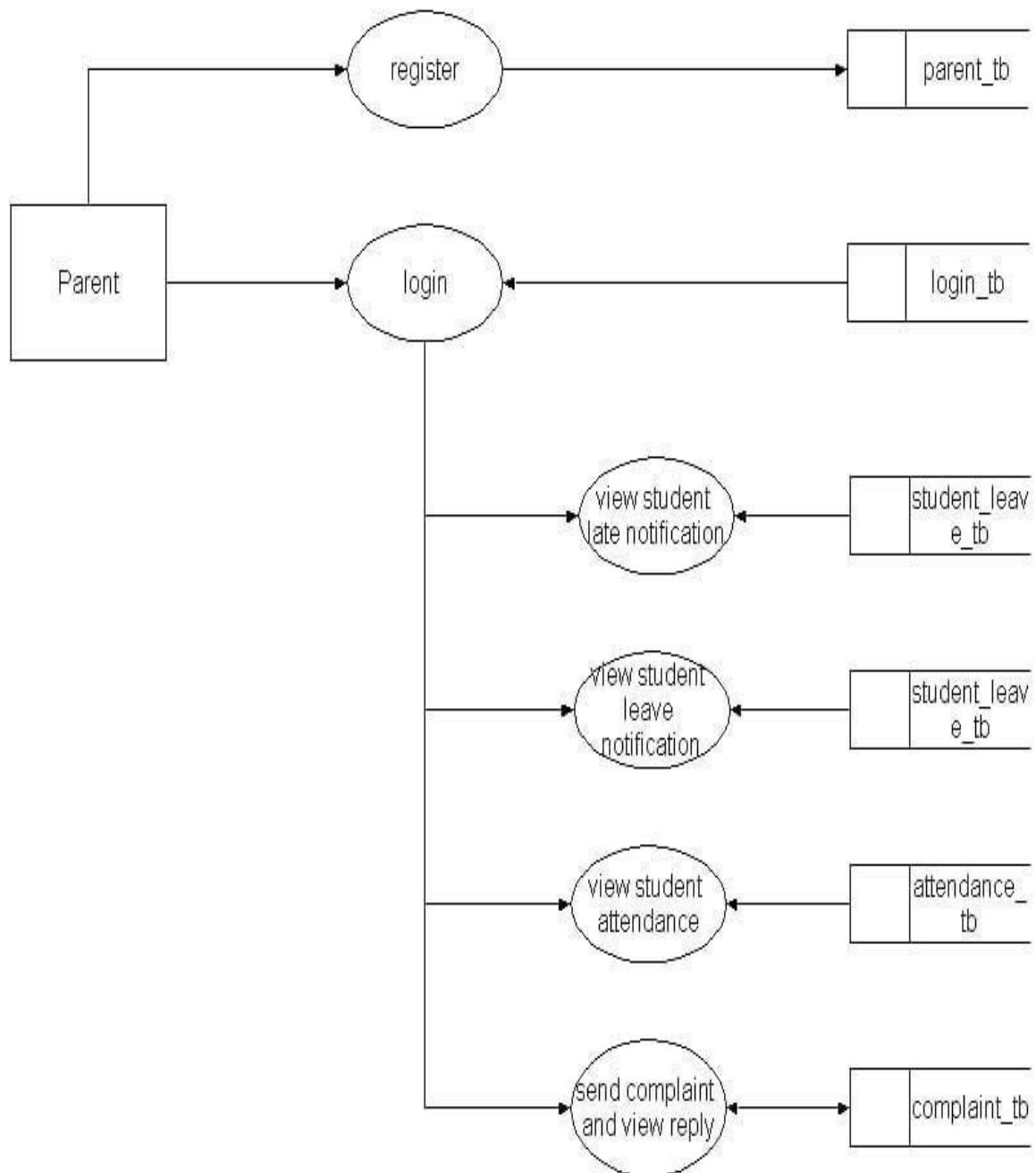
## Level 1.2 DFD



Level 1.3 DFD



#### Level 1.4 DFD



# ER DIAGRAM

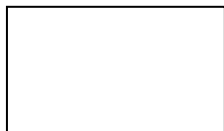
## ENTITY RELATIONSHIP DIAGRAM

Entity relationship diagram(ER) is a major data modelling tool and will help organize the data in your project into entities and define the relationships between the entities. This process has proved to enable to produce a good database structure so that data can be stored and retrieved in a most efficient manner.

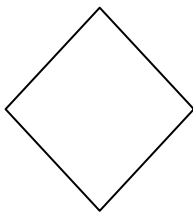
**Entity:** A data entity is anything real or abstract about which we want to store data. Eg: Employee, payment, campus.

**Relationship:** A data relationship is a natural association that exists between one or more entities. Eg: Employees process payments. Cardinality defines the number of occurrences of the related entities.

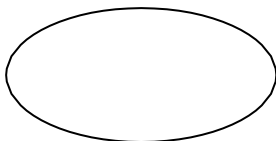
**Attribute:** A data attribute is a characteristic common to all or most instances of a particular entity. Eg: name, address. An attribute or combination of attributes that uniquely identifies one and only one instance of an entity is called a primary key.



Entity

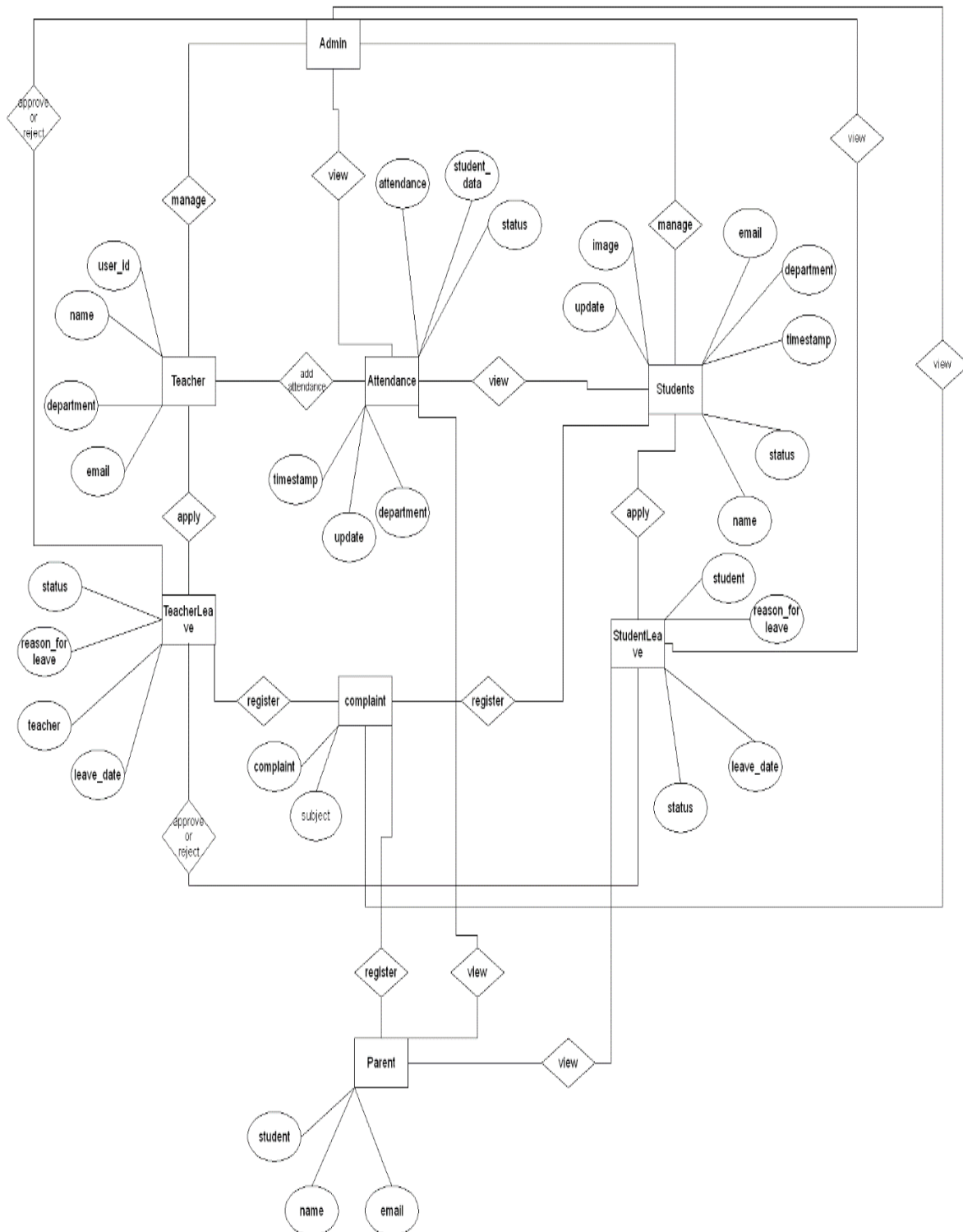


Relationship



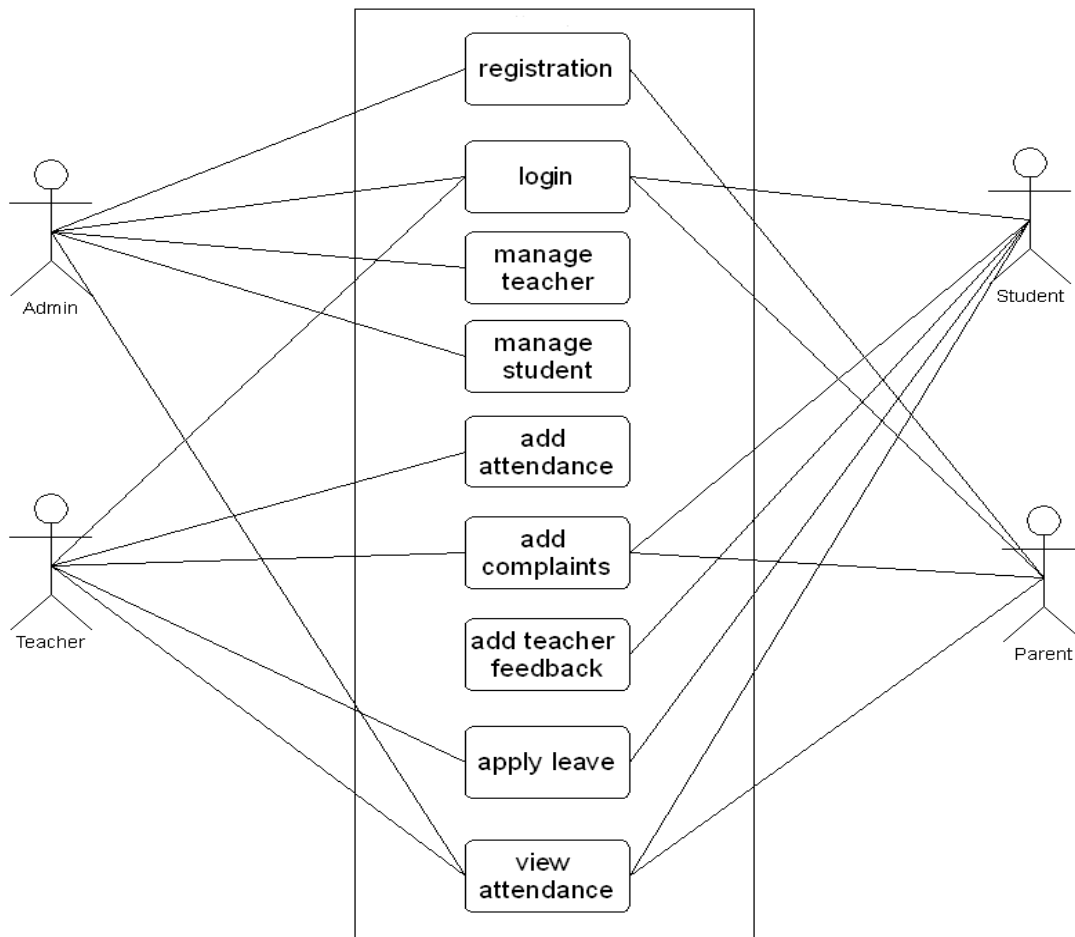
Attribute

## E-R Diagram



## USE CASE DIAGRAMS

Use case is otherwise called conduct chart. A use case chart is utilized to speak to client's communication with the framework which shows the link within the client and the individual use cases to which the applicant is combined. A use case chart may categorize the distinct kind of clients of a framework and the peculiar use cases as well as determination once again is merged by distinct kind of outlines as well. A use case portrays a preparation of events which a few framework or frameworks have to or can work as a unit with one or more outside applicants of the framework. A use case is an approach appropriate as a section of structural analysis to differentiate, elucidate, and figure out structural obligations





## **DATABASE DESIGN**

A database is a collection of logically related records .The main objective of database design is to provide effective auxiliary storage without any application and to contribute to overall efficiency of the computer program components of the whole system.

The organization of data in the database aims to achieve the following objectives:

- Controlled redundancy
- Ease of learning in use.
- Data independence
- More information in low cost
- Accuracy and integrity
- Recovery from failures
- Privacy & security
- Performance

The design should be done in a way the information stored in the database can retrieved quickly whenever necessary.

## **NORMALIZATION**

Normalization theory is built around the concept of normal form. Normalization reduces necessary redundancies of data in database. Redundancy can cause problem with storage and retrieval of data in database. During the process of normalization, dependencies can be identified which can cause problem during deletion and updating database. Normalization theory is based on the fundamental for fundamental dependency. Normalization helps in simplifying structure of tables.

### **FIRST NORMAL FORM**

Moving data into separate table when the data in each table is of similar type and giving each table a primary key to this. This eliminates repeating groups of data.

## **SECOND NORMAL FORM**

First normal form table can be converted into second normal form by taking out data that is only depend on part of the key.

## **THIRD NORMAL FORM**

This means getting rid of anything in the table that does not depend to primary key. Any time the data is in third normal form, is already automatically in second normal form. There must be no indirect relationship between attributes.

## TABLE DESIGN

### CustomUser\_db

Column name	data type	Constraints
Login_id	Int(11)	Primary key
username	Varchar(20)	
password	Varchar(20)	
role	bool	

### Students\_db

Column name	data type	Constraints
user_id	Int(11)	Foreign key
Name	Varchar(20)	
department	Varchar(20)	
Email	Varchar(20)	
image	file	
status	Varchar(20)	
update	int	Unique
timestamp	int	Unique

### Teacher\_db

Column name	data type	Constraints
user_id	Int(11)	Foreign key
Name	Varchar(20)	
department	Varchar(20)	
Email	Varchar(20)	

### Parent\_db

Column name	data type	Constraints
user_id	Int(11)	Foreign key
name	Varchar(20)	
email	Varchar(20)	
student	Int(11)	Foreign key

### Attendance\_db

Column name	data type	Constraints
id	Int(11)	Unique
attendance	Varchar(20)	
student_data	Varchar(20)	
attendance	Varchar(20)	
status	bool	
dept	Varchar(20)	
update	datetime	
timestamp	datetime	

### TeacherLeave\_db

Column name	data type	Constraints
id	Int(11)	Unique
teacher	Int(11)	Foreign key
leave_date	Varchar(20)	
reason_for_leave	Varchar(20)	
status	bool	

### StudentLeave\_db

Column name	data type	Constraints
id	Int(11)	Unique
student	Int(11)	Foreign key
leave_date	Varchar(20)	
reason_for_leave	Varchar(20)	
status	bool	

### Complaint\_db

Column name	data type	Constraints
id	Int(11)	Unique
user	Int(11)	Foreign key
subject	Varchar(20)	
complaint	Varchar(20)	
reply	Varchar(20)	

Feedback\_db

Column name	data type	Constraints
id	Int(11)	Unique
teacher	Int(11)	Foreign key
student	Int(11)	Foreign key
feedback	Varchar(20)	

# **SYSTEM DEVELOPMENT & SYSTEM TESTING**

## SYSTEM DEVELOPMENT

In the development phase of the Self- configurable Smartphone Monitoring System based on Android software constructed from the specification proposed in the design phase . Equipment is acquired and installed in the development phase. All necessary procedure manuals, software specification and other documentation are compiled. The software is designed in user friendly manner, so that even a beginner in computer can handle the system without much difficulty. In the development phase, all the design specifications are implemented with minimum cost and necessary care has been taken in order to hide the implementation details from the user.

System development resolves around a life cycle that begins with recognition to user needs. Following a feasibility study, the key stages of the cycle are evaluation of the present system, information gathering, cost/benefit analysis, detailed design and implementation of the candidate system. The life cycle is not a procedure that deals with hardware and software. It is building computer based system to help the user to open at a business or make decision effectively and manage an enterprise successfully.

The stages of system development are as follows:

- Initial investigation
- Feasibility study
- Analysis
- Design
- Implementation
- Post implementation and maintenance

## **SYSTEM TESTING**

### **TESTING**

Testing is the major quality measure employed during software development. After the coding phase, computer programs available are executed for testing purposes; Testing not only has to uncover errors introduced during coding, but also locates errors committed during the previous phases. Thus the aim of testing is to uncover requirements, design or coding errors in the program. No system design is ever perfect. Communication problem, programmer's negligence, or time constraints create error that must be eliminated before the system is ready for user acceptance testing. A system is tested for on-line response, volume of transaction stress, recovery from failure, and insurability. Following system testing is acceptance testing, or live running the system with live data by the actual user. Testing is a process of executing a program with the intend of finding an error.

- A good test case is one that has a highest probability of finding an as yet undiscovered error.
- A successful test is one that uncovers an as yet undiscovered error.

### **Testing Objectives**

- Testing is the process of executing the program with the intention of finding an error
- A good test case is one that has a highest probability of finding an as-yet-undiscovered error.
- A successful test is one that which uncovers an as yet-undiscovered error.

### **Test Procedure**

- Prepare the test case
- Record the expected result and verify whether in tune with actual results.
- If actual results are not tune with expected results, do not necessary work.
- Test again and check the results.



### **Test Characteristics**

- A good test has a high profitability of finding an error.
- A good test is redundant. Testing time and resources are limited.
- A good test should be "best of breed". In a group of tests that have a similar intent, time and resource limitations may mitigate towards the execution of only a subset of these tests.
- A good test should be neither too simple nor too complex.
- A test case in software engineering is a set of conditions or variables under which a tester will determine whether an application or software system is working correctly or not.
- In my project, testing is done at all stages of the program development. After completing each module, I perform unit testing and then integration testing is done by combining several modules. Validation testing is done frequently during the development.

### **UNIT TESTING**

Unit testing focuses verification efforts on the smallest unit of software design module. To check whether each module in this software works properly so that it gives desired outputs to the given inputs. All validations and conditions are tested in the module level in the unit test control parts are tested to ensure the information correctly flows into, and out of the program unit under test. Boundary conditions are tested to ensure that modules operate at the boundaries. All independent parts through the control structure ensure that all statements in a module have been executed at least once.

### **INTEGRATION TESTING**

Integration testing is the phase of software testing in which individual software modules are combined and tested as a group. It follows unit testing and precedes system testing. Integration testing takes as its input modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test those aggregates, and delivers as its output the integrated system ready for system testing. The purpose of integration testing is to verify functional, performance and reliability requirement placed on major design items. In my work, I did integration testing by combining the above said different units into a single module or a single unit.

## **SYSTEM TESTING**

System testing of software or hardware is testing conducted on complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within a scope of black box testing and as such, should require no knowledge of inner design of the code or logic. As a rule, system testing takes, as its input, all of the "integrated" software components that have successfully passed integration testing and also the software system itself integrated with any applicable hardware system.

The purpose of integration testing is to detect any inconsistencies between the software units that are integrated together (called assemblages) or between any of the assemblages and the hardware.

System testing is a more limiting type of testing; it seeks to detect defects both within the "inter-assemblages" and also within the system as whole. System testing is the process of executing the program with the intent of finding errors. Testing cannot show the absence of defects, it can only show that software errors are present.

## **ACCEPTANCE TESTING**

Acceptance testing is sometimes performed with realistic data of the client to demonstrate that the software is working satisfactorily. Testing here focuses on the external behaviour of the system: the internal logic of the program is not emphasized. Consequently, mostly functional testing is performed at these levels.

## **VALIDATION TESTING**

### **FRONT- END VALIDATION**

Everything is validated on the server to prevent someone creating an alternative client to access/manipulate database. Front end is also necessary as it improves efficiency and prevents the server being accessed with inappropriate data. Front end (interface) validation is for data entry help and contextual messages. This ensures that the user has a hassle free data entry experience; and minimizes the round-trip required for validate correctness. Front end validation validate all input in a modern application, providing the user with quick feedback on possible issues (for example a JS popup saying "this is not a valid email address"). In the UI ,tourist guide do basic input validation - like checking mandatory fields, or validity of an email address; and updating or disabling UI controls based on that.

## **BACK-END VALIDATION**

Back-end validation is also an essential part. It has to ensure that the data coming in is indeed valid. Additionally, depending on the architecture, generally re-use the middle-tier business logic amongst multiple components so need to ensure the rules that are applied are always consistent - regardless of what the front-end logic enforces.

## **WHITE BOX TESTING**

White box testing is a test case design method that uses the control structure of the procedural design to derive test cases. Using White box testing methods, we can derive test cases, that

1. Guarantee that all independent paths within a module have been exercised at least once.
2. Exercise all logical decisions on their true and false sides.
3. Execute all loops at their boundaries and within their operational bounds.
4. Exercise internal data structures to ensure their validity.

## **BLACK BOX TESTING**

Black box testing methods focus on the functional requirements of the software. That is, black box testing enables us to derive sets of input conditions that will fully exercise all functional requirements of the program.

Black box testing attempts to find errors in the following categories:

1. Incorrect or missing functions.
2. Interface errors.
3. Errors in data structure or external database access.
4. Performance errors.
5. Initialization and termination error.

# **SYSTEM IMPLEMENTATION & SYSTEM MAINTANENCE**

# **SYSTEM IMPLEMENTATION AND SYSTEM MAINTANENCE**

## **SYSTEM IMPLEMENTATION**

Implementation is the stage in the project where the theoretical design is turned into a working system and is giving confidence on the new system for the uses that it will work efficiently and effectively. It involves careful planning, investigation of current system and its constraints on implementation, design of methods to achieve the changeover, an evaluation, of changeover methods. Apart from planning major task of preparing the implementation are education and training of users. The more complex system being implemented, the more involved will be the system analysis and the design effort required just for implementation, on implementation coordinating committee based on policies of individual organization has been appointed.

The implementation process begins with preparing the plan for the implementation for the system. According to this plan, the activities are to be carried out, discussion made regarding the equipment and resources and the additional equipment as to be acquired to implement the new system. The implementation is the final and important phase. The most critical stage in achieving successful new system and in giving the user confidence that the new system will work and be effective. The system can be implemented only after thorough testing is done and if it found to working according to the specification. This method also offers the greatest security. Since the old system can take over if the errors are found or inability to handle certain type of transaction while using new system.

## **IMPLEMENTATION PLAN**

Implementation includes all those activities that take place to covert from old system to new. At this stage the theoretical design is turned into a working system. The crucial stage in achieving a successful new system and giving confidence on the system for the users that will work efficiently and effectively. The implementation involves careful planning, investigation, of the current system and its constraints on implementation, design of methods to achieve the changeover.

## **IMPLEMENTATION PLAN PREPARATION**

The implementation process begins with preparing a plan for the implementation of the system. In this plan, discussion has been made regarding the equipment, resources, and how to test the activities.

## **EQUIPMENT ACQUISITION**

The equipment acquisition includes purchasing of servers, client machines and other accessories.

## **PROGRAM CODE PREPARATION**

One of the most important development activities is the coding of programs. The system flowchart is converted into modular programs. They have to be compiled, tested and debugged. The user requirements are achieved through building software keeping in mind of their requirements.

## **EDUCATION AND TRAINING**

The product will include user manual which will include product overview, complete configuration of the used software, technical details, backup procedure and contact information. The product will be compatible with the windows XP or higher.

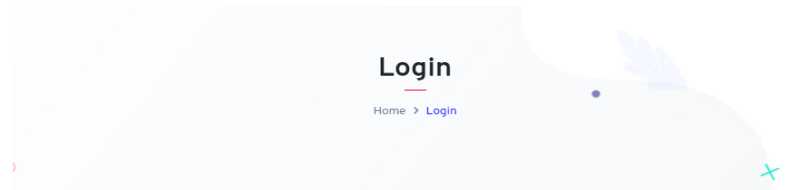
## **SYSTEM MAINTANENCE**

Maintenance corresponds to restoring something to original condition covering, a wide range of activity; including correcting coding, design errors, updating user support. Better the system design, easier to maintain the system. Maintenance is performed most often to improve the existing software rather than to respond to a crisis or system failure . According to user needs and operational environment change maintenance should be done in parallel, otherwise the system could fail. Provision must be made for environmental changes, which may affect either the computer or other parts of a computer-based system such as activity are normally called maintenance. It includes both improvement of system functions and the correction of faults that arise during the operation of a system. Maintenance activity may require the continuing involvement of a large proportion of computer department resources. Most changes arise in two ways.

As part of the normal running of the system when errors are found, users ask for improvement of external requirements change. As the results of specific investigation and review of the systems performance, maintenance involves the software industry captive, typing of system resources. It means restoring something to its original condition. Maintenance was done after the successful implementation. Maintenance is continued till the product is re-engineered or deployed to another platform. Maintenance is also done based on fixing the problem reported, changing the interface with other software or hardware, enhancing the software. Any system developed should be secured and protected against possible hazards. Security measures are provided to prevent unauthorized access of the database at various levels. An un interrupted power supply should be provided so that power failure or voltage fluctuations will not erase the data in the files.

## SCREENSHOTS

### Login



**Login**

If you have an account with us, please log in.

Username\*

Password\*

**LOGIN**

Activate Windows  
Go to PC settings to activate Windows.

### 1. ADMIN

Approve Leave For Teachers:

Home ▾ Departments ▾ Students ▾ Teacher ▾ Attendance ▾ Leaves ▾ Complaints And Feedbacks ▾ User.admin ▾

**Admin\_panel**

Home > Teacher Leave > /teacher\_leaves\_ad/

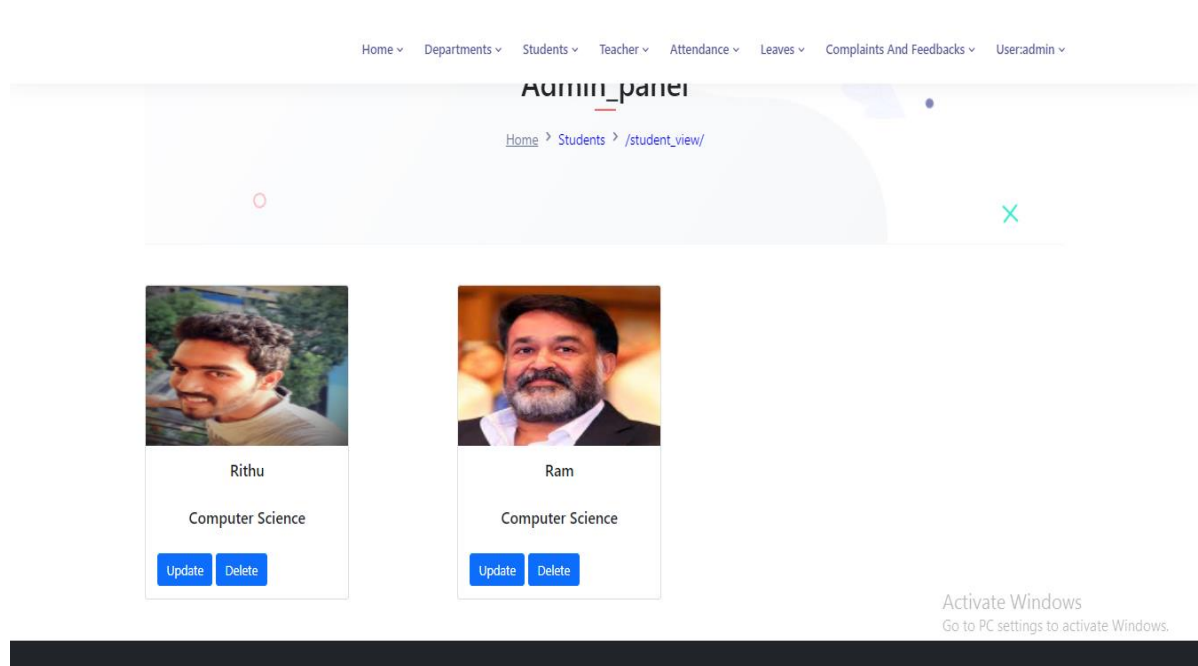
**Teacher Leaves**

Sl NO	NAME	LEAVE DATE	REASON	ACTION
1	Vinu	June 2, 2021	function	<button>Approved</button>
2	Vinu	June 3, 2021	function	<button>Approve</button> <button>Reject</button>

Activate Windows  
Go to PC settings to activate Windows.

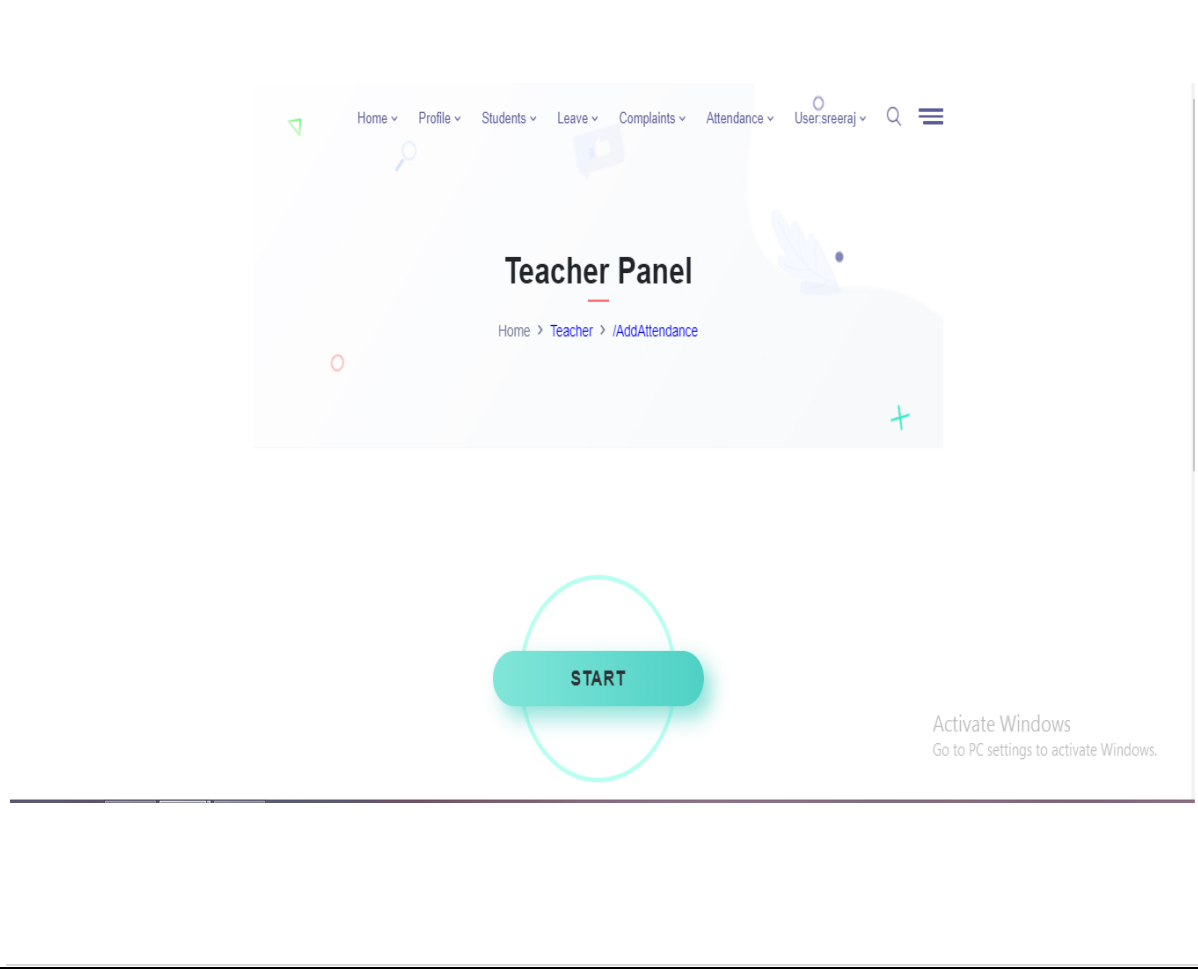


## View Students :

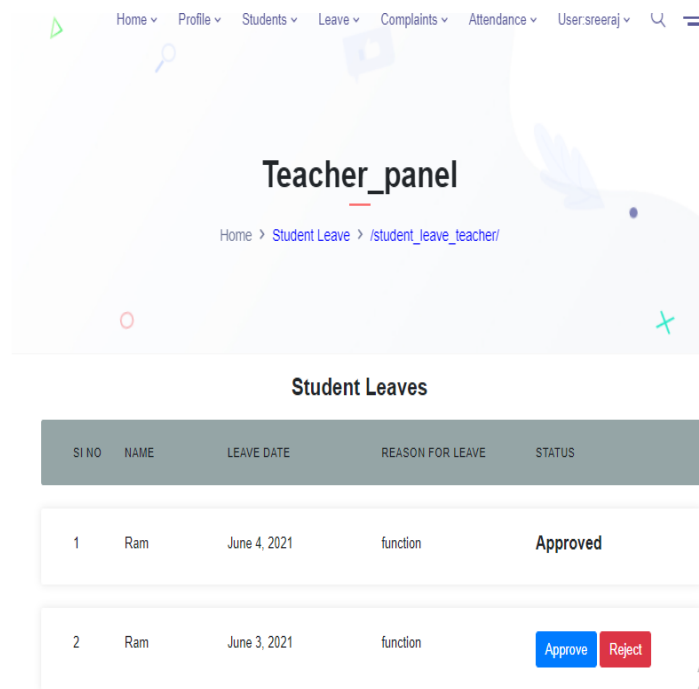


## TEACHER

### Add Students Attendance :



## Approve Student Leaves:



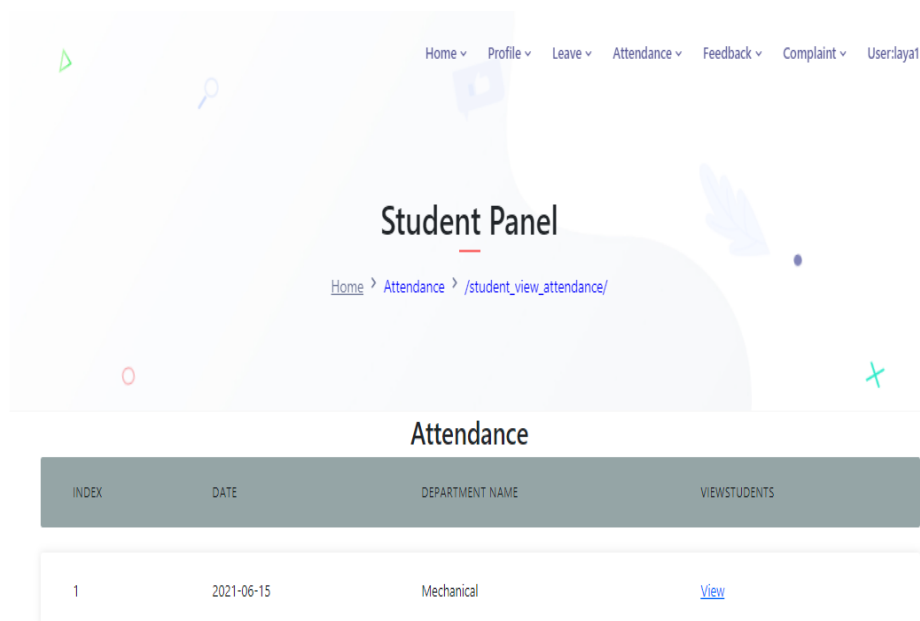
The screenshot shows the 'Teacher\_panel' interface. At the top, there is a navigation bar with links: Home, Profile, Students, Leave, Complaints, Attendance, and User: sreeraj. Below the navigation bar, the title 'Teacher\_panel' is displayed, followed by the breadcrumb 'Home > Student Leave > /student\_leave\_teacher/'. The main content area is titled 'Student Leaves' and contains a table with the following data:

SI NO	NAME	LEAVE DATE	REASON FOR LEAVE	STATUS
1	Ram	June 4, 2021	function	Approved
2	Ram	June 3, 2021	function	<button>Approve</button> <button>Reject</button>

At the bottom right, there is a watermark that says 'Activate Windows Go to PC settings to activate Windows.'

## STUDENT

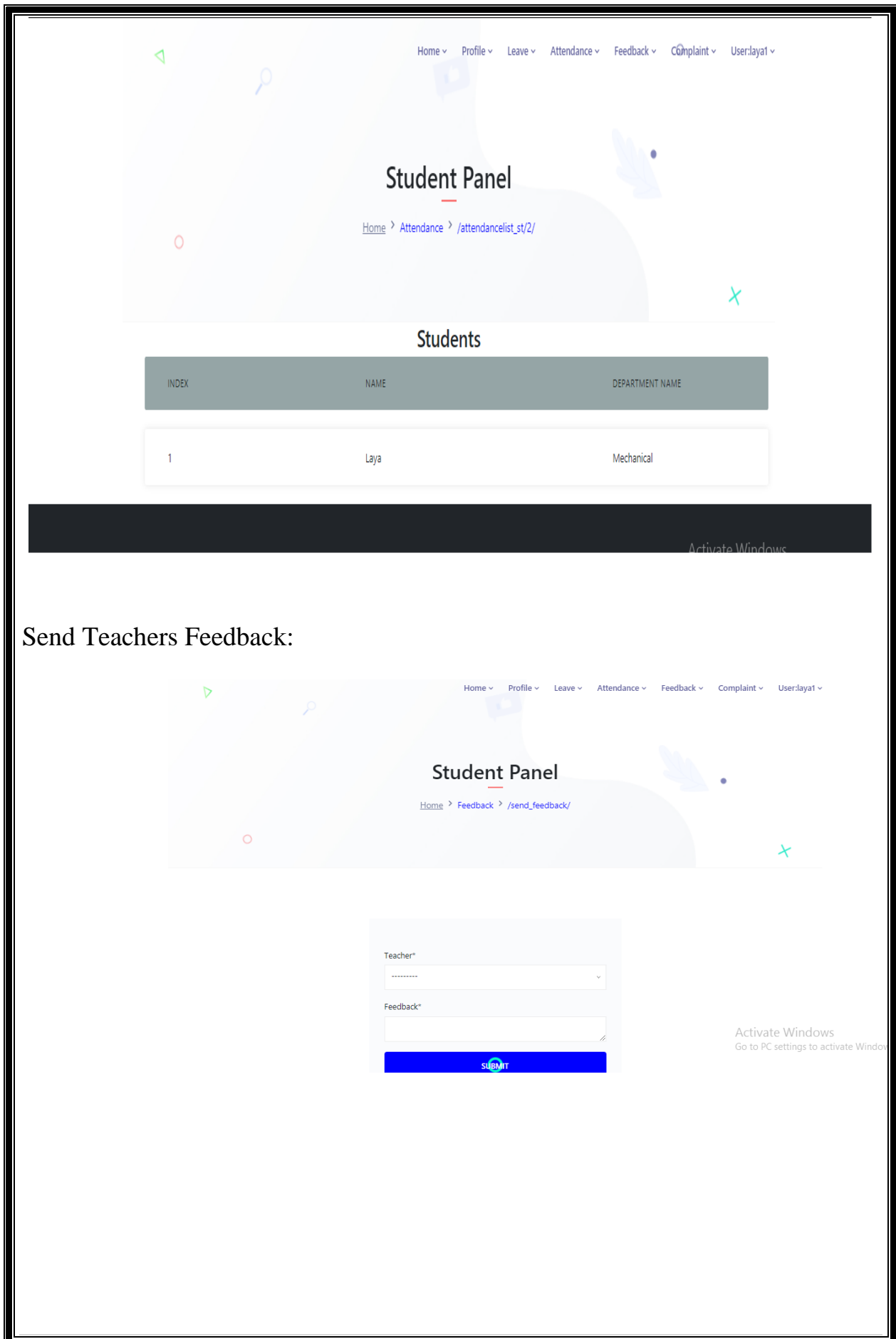
### View Attendance :



The screenshot shows the 'Student Panel' interface. At the top, there is a navigation bar with links: Home, Profile, Leave, Attendance, Feedback, Complaint, and User: layat. Below the navigation bar, the title 'Student Panel' is displayed, followed by the breadcrumb 'Home > Attendance > /student\_view\_attendance/'. The main content area is titled 'Attendance' and contains a table with the following data:

INDEX	DATE	DEPARTMENT NAME	VIEWSTUDENTS
1	2021-06-15	Mechanical	<a href="#">View</a>

At the bottom right, there is a watermark that says 'Activate Windows'.



## Apply Leave :

The screenshot shows the 'Student Panel' interface. At the top, there is a navigation bar with links: Home, Profile, Leave, Attendance, Feedback, Complaint, and Userlaya. Below the navigation bar, the title 'Student Panel' is displayed. Underneath the title, a breadcrumb trail reads: Home > Leave > /apply\_leave\_student/. The main content area contains a form with two fields: 'Leave date\*' with a date picker showing 'mm/dd/yyyy' and a calendar icon, and 'Reason for leave\*' with a text input field. A blue 'SUBMIT' button is located at the bottom of the form. To the right of the form, there is a message: 'Activate Windows Go to PC settings to activate Windows.'

## PARENT

### View Student Leave :

The screenshot shows the 'Parent Panel' interface. At the top, there is a navigation bar with links: Home, Leaves, Complaints, and Userjisha. Below the navigation bar, the title 'Parent Panel' is displayed. Underneath the title, a breadcrumb trail reads: Home > Student Leave > /view\_student\_leaves/. The main content area is titled 'Student Leaves'. It contains two light blue notification boxes. The first box states: 'Your Child Ram has applied leave for the date June 4, 2021 with reason function, Application status is Approved'. The second box states: 'Your Child Ram has applied leave for the date June 3, 2021 with reason function, Application status is Approval Pending'. At the bottom of the page, there is a dark grey bar with the text 'Activate Windows'.

## View Complaint Replies :



### Complaint Replies

SI NO	NAME	SUBJECT	COMPLAINT	REPLY
1	jjisha	student leaves	ddddddddd	Not replied

## **FUTURE ENHANCEMENT**

The “**Students Face Recognition Based Attendance System & Services**” has been designed to make the prevailing attendance system is definitely a bit of time consuming process and it appends more efforts of the teacher , As the covid-19 is expanding it is not very safe to use the devices which requires physical contact like biometrics.

Face recognition technique requires minimum human intervention. Face recognition based attendance system is a process of recognizing the students face for taking attendance by using face biometrics based on high - definition monitor video and other information technology.

We can do future enhancements mainly on following fields of product

- Include face recognition technology for attendance, in every colleges and schools.
- Include face recognition technology in offices

## **CONCLUSION**

The face recognition method has several external advantages compared to the other biometric methods. Advanced security and authorization are key to ensure the security of any resources or data. It requires minimum human intervention on a daily basis. The paper based attendance is clearly waste of time. An outdated attendance system would neither be teacher-friendly nor give you insightful data on time. Face recognition technology will take barely few seconds for the authentication process saving precious man hours. Amidst covid-19 it is not very preferable to use devices which requires physical contact like biometrics. Face recognition based attendance system, it scans all the students details with 100% accuracy in face detection .Faces once recognized are accurately stored in teachers database.

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### REFERENCES

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- Real time face recognition system using PCA and various distance classifiers by Deepesh Raj –IIT Kanpur .
- Adrian Rhesa Septian Siswanto ,Anto Satriyo Nugroho, Maulahikmah Galinium, ‘Implementation of Face recognition algorithm for biometrics basetime attendance system’ IEEE ICT For Smart Society(ICISS), International conference , January 2015

### Website Visited

- <http://www.google.com>
- <http://www.tutorialspoint.com>
- <http://www.djangoproject.com>
- <http://www.codeproject.com>