# 1. INTRODUTION

## 1.1 Project Description

This softwre is aimed at developing application software which takes care of various transactions carried out at the chemistry lab of the college. Chemistry Lab is a place where students will have all the facilities to conduct various experiments and learn the subject practically. When it comes to chemistry lab we need the things such as test tubes, burettes, conical flask, puppets and many chemicals, while conducting the experiments there is a possibility of breaking the equipment's.

The experiments in the lab are conducted batch wise each batch includes a fixed number of students the equipment's and chemical required for the experiments are issued by the lab instructor to each batch after finishing the experiments the students have to return the equipment's. All these transactions are right now maintained manually by recording all the information in ledger.

The equipment's purchased, required, equipment's broken by the students while conducting experiments all these information is recorded periodically in a file by the in charge person. In our project called "e-LABS", we have tried to give a complete soft solution to the various transactions carried out in the laboratory.

In this project we have tried to computerize all above said transactions by developing suitable application software. We have used PHP as our front end tool for developing easy to use interface and MySQL as our Back end tool for maintaining the data base.

## Objectives

- It allows staff to maintain the stock of components
- Every day lab usage details are monitored
- Keeps track of experiments carried out by the students in each batch
- Keeps track of breakage and fine amount details
- Allows students to download the lab manual
- Balance sheet at the yearend could be generated

# 2. LITRATURE SURVEY

## 2.1 Existing System and Proposed System

### Existing System

The experiments in the lab are conducted batch wise each batch includes a fixed number of students the equipment's and chemical required for the experiments are issued by the lab instructor to each batch after finishing the experiments the students have to return the equipment's. All these transaction are right now maintained manually by recording all the information in ledger.

The equipment's purchased, required, equipment's broken by the students while conducting experiments all these information is recorded periodically in a file by the in charge person. In our project called "Chemistry-Lab Management System", we have tried to give a complete soft solution to the various transactions carried out in the laboratory.

### Limitations

1. Requires more man power
2. No distributed access
3. No search facility
4. High maintenance cost
5. Not reliable
6. Error prone

### Proposed System

In the proposed system we have tried to computerize all above said transactions by developing suitable application software. The project has been developed using PHP as front end tool and MySQL as back end tool; the task is divided into modules and is connected in a proper way, the following steps are adopted to give the solution

- Proper Database planning

  Using appropriates constraints in the table
- Proper Admin and user's authentication
- Suitable forms designing

## Advantages of proposed system

- Ensure data accuracy's.
- Proper control of the higher officials.
- Reduce the damages of the machines.
- Minimize manual data entry.
- Minimum time needed for the various processing.
- Greater efficiency.
- Better service.
- User friendliness and interactive.
- Minimum time required.

## 2.2 Feasibility Study

The feasibility study is an evaluation and analysis of the potential of a proposed project which is based on extensive investigation and research to support the process of decision making.

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest terms, the two criteria to judge feasibility are cost required and value to be attained.

A well-designed feasibility study should provide a historical background of the business or project, a description of the product or service, accounting statements, details of the operations. Generally feasibility studies precede technical development and project implementation.

## Operational feasibility

Our project entitled "e-Labs" is an application software which is designed for chemistry department of davangere university. Using this package all the transactions carried out in the chemistry lab can be managed.

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The equipment's purchased, required, equipment's broken by the students while conducting experiments all these information is recorded periodically in a file by the in charge person. In our project called "Chemistry-Lab Management System", we have tried to give a complete soft solution to the various transactions carried out in the laboratory.

## Technical Feasibility

The technology feasibility to the proposed system could be summarized as below. **Data storage** All information is stored in the MySQL database which best suited for distributed application, it does not require any additional drivers to make transactions with database it is

added advantage, the proposed system works on the principle of client server architecture it does not require additional software at client side to make the system functional

**Web server**

Server which needs to execute continuously and serve client requests reliably, in this project Apache web server is used for this purpose which provides service at 3306 dedicated port, server has the potential to work concurrently and provide service to clients instantly, it works best on Linux platform as it is a multiuser operating system. This server executes the PHP programs efficiently

**Server Scripting**

In the proposed system server side scripting is done using PHP language, the language supports both procedural and object oriented approach, it is flexible language as it supports variant data type, for each loop with key value concept which is very help full to navigate through arrays of different types.

## 2.3 Tools and Technologies Used

## Introduction to PHP

PHP is an open-source server-side scripting language we can create dynamic web pages with the PHP scripting language. A dynamic Web page interacts with the user, so that each user visiting the page sees customized information. PHP can also be used to create dynamic web pages that are generated from information accessed from a MySQL database. we can embed PHP commands within a standard HTML page. PHP's syntax is similar to that of C and Perl, making it easy to learn for anyone with basic programming skills. Another feature that PHP offers is connectivity to most of the common databases (including Oracle, Sybase, MySQL, ODBC and many others, although currently only MySQL is supported on the central webservers.) PHP also offers integration with various external libraries, which allow the developer to do anything from generating PDF documents to parsing XML.

PHP also has evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP can be deployed on most Web servers and also as a standalone shell on almost every operating system and platform free of charge.

PHP interpreters are available on both 32-bit and 64-bit operating systems, but on Microsoft Windows the only official distribution is a 32-bit implementation, requiring

Windows 32-bit compatibility mode while using Internet Information Services (IIS) on a 64-bit Windows platform. Experimental 64-bit versions of PHP 5.3.0 were briefly available for MS Windows, but have since been removed.

Originally designed to create dynamic Web pages, PHP now focuses mainly on server-side scripting, and it is similar to other server-side scripting languages that provide dynamic content from a Web server to a client, such as Microsoft's ASP.NET, Sun Microsystems' Java Server Pages, and mod_perl. PHP has also attracted the development of many frameworks that provide building blocks and a design structure to promote rapid application development (RAD).

The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL is written in C and C++. Its SQL parser is written in yacc, and a home-brewed lexical analyzer named sql_lex.cc.

MySQL can be built and installed manually from source code, but this can be tedious so it is more commonly installed from a binary package unless special customizations are required. On most Linux distributions the package management system can download and install MySQL with minimal effort, though further configuration is often required to adjust security and optimization settings.

## Introduction to Apache web server

The Apache HTTP Server, commonly referred to as Apache is web server software notable for playing a key role in the initial growth of the World Wide Web In 2009 it became the first web server software to surpass the 100 million web site milestone and performance typically Apache is run on a Unix-like operating system

Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation. The application is available for a wide variety of operating systems, including Unix, , Linux, Solaris, Novell NetWare, Mac OS X, Microsoft Windows. Released under the Apache License, Apache is characterized as open-source software. Apache was originally based on NCSA HTTP code. According to the FAQ in the Apache project website, the name Apache was chosen out of respect to the Native American tribe Apache (Inde) and its superior skills in warfare and strategy. Apache supports a variety of features, many implemented as compiled modules which extend the core

functionality. These can range from server-side programming language support to authentication schemes. Some common language interfaces support Perl, Python, TCL, and PHP.

Apache features configurable error messages, DBMS-based authentication databases, and content negotiation. It is also supported by several graphical user interfaces (GUIs).It supports password authentication and digital certificate authentication. Apache has a built in search engine and an HTML authorizing tool and supports FTP.Although the main design goal of Apache is not to be the "fastest" web server, Apache does have performance similar to other "high-performance" web servers.

## Introduction to MySQL

What Is MySQL?

- A fast, reliable, easy-to-use, multi-user multi-threaded relational database system.
- It is freely available and released under GPL (GNU General Public License).

Why Use MySQL?

- MySQL server can handle very large databases.
- Offers rich and very useful set of functions.
- Connectivity, speed and security make MySQL very suited for accessing
- database on a network.
- A lot of contributed software available.

What Does MySQL Offer?

- A privilege and password system that is very flexible and secure and allows host-based verification.
- Multi-threaded request-handling using kernel thread.
- Replication features.
- Very actively developed.
- Memory leak proof.

Basic MySQL Operations

- Create table

- Insert records
- Load data
- Retrieve records
- Update records
- Delete records
- Modify table
- Join table
- Drop table
- Optimize table
- Count, Like, Order by, Group by
- More advanced ones (sub-queries, stored procedures, triggers, views …)

How MySQL stores data (by default)

- A MySQL server can store several databases
- Databases are stored as directories
- Default is at /user/local/MySQL/var/
- Tables are stored as files inside each database (directory)
- For each table, it has three files:

o table.FRM file containing information about the table structure
o table.MYD file containing the row data
o table.MYI containing any indexes belonging with this table, as well as some statistics about the table.

## Introduction to html

Web pages are written in a language called HTML (Hyper Text Markup Language). HTML allows users to produce web pages that include text, graphics, and pointers to other web pages. HTML is a markup language, a language for describing how documents are to be formatted.

HTML is a pre-defined set of tags to format text, create hyperlinks to other places, and insert graphic images. When a web browser open an HTML file, it displays the page based on the tags. it's a simple, universal mark-up language that allows web publishers to create complex pages of text and images that can be viewed by anyone else on the web.HTML allows us to publish documents to the internet in a platform independent format.

It creates links to related works from the document. HTML is used here to capture User/Adviser input and convey it to an application on the server.

An HTML form is simply a section of a document that begins with<FORM> tag, followed by any number of input elements and a closing</FORM> tag.

The input element within a form can be specified in 3 ways

i. The <INPUT> tag

ii. The <TEXTAREA> tag

iii. The <SELECT>and <OPTION> tags

**HTTP – Hyper Text Transfer Protocol**

Hyper Text Transfer Protocol is the language used to describe how web documents are sent over the Internet. A web server operates by listening for requests on a well-known port number. The default is port 80, although any available port can be used. If a web server listens on a different port, URLs that refer to this server must include a colon and the port number immediately after the server name.

## 2.4 Hardware and Software Requirements

**Software Requirements**

- OPERATING SYSTEM : windows 7 or higher
- FRONT END TOOL : P.H.P
- BACK END TOOL : MYSQL
- SERVER : APACHE WEB SERVER

**Hardware Requirements**

- PROCESSOR : intel i3 or any compatible
- RAM : 2GB ram
- HARD DISK : 500 GB
- MONITOR : 1024X768(RESOLUTIONS)
- KEYBOARD
- MOUSE
- PRINTER

# 3. SOFTWARE REQURIMENTS SPECIFICATION

## 3.1 Users

Following are the different types of users of the system

*Admin*

Admin is nothing but the higher authority of the department in the college, admin has moreover privileges than other users.

*Staff or Faculty*

These are the faculty members of the department, they get an account through admin and have rights to post department related notifications add breakage details and manage the lab register book

*Students*

Student would get the details such as notification's details, urls to download the useful stuff video tutorials of experiments. Students would get all these details at the home itself

## 3.2 Functional Requirements

These are statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations. In some cases, the functional requirements may also explicitly state what the system should not do.

The functional requirements for a system describe what the system should do. These requirements depend on the type of software being developed, the expected users of the software and general approach taken by the organization when writing requirements. When expressed as user requirements, the requirements are usually described in fairly abstract way. However functional system requirements describe the system function in detail, its inputs and outputs, exceptions, and so on. Functional requirements for a software system may be expressed in a number of ways.

In our project the following modules are used

- Admin module

Admin is the main user of the system who has rights to add students, staff, upload information etc.

- Student module
  In this module the details of the students are managed

- Staff module
  In this module the details of the staff are managed.

- Experiments module
  in this module the details of the experiments are managed.

- Components module
  In this module the details of the components such as test tubes, burettes, conical flasks etc. are managed.

## 3.3 Non-Functional Requirements

- **Availability**- System must be available for the working hours. this application is amiable to users all the time since it will be hosted on a real server.
- **Price**-Since it is developed using open source technologies price is less.
- **Usability**- It should be friendly to use and different pages. User interface should be good. We have used easy to use interface hence users find it handy to use.
- **Scalability**- since it will be hosted on real server, it is available to all users all the time, depending on the traffic and bandwidth performance may vary.
- **Performance**- it is working properly in the localhost, its performance will be good at real host too
- **Reliability**- Since care is taken address all the run time issues product is reliable and serves the purpose properly.

# 4. SYSTEM DESIGN

## 4.1 SYSTEM PERSPECTIVE

In the systems perspective, once one has identified the system as a separate part of the universe, one is not allowed to progressively decompose the system into isolated parts. Instead, one is obligated to describe the system as a whole. If one uses separation into parts, as part of the description of the system properties, this is only part of a complete description of the behavior of the whole, which must include a description of the relationships between these parts and any additional information needed to describe the behavior of the entire system.

Further, in a systems perspective one should be careful about considering the system in the context of the environment and not as an isolated entity. Thus one should include the interactions and relationships between the system and the environment. The main components of the system are:

- Admin module

  Admin is the main user of the system who has rights to add students, staff, upload information etc.

- Student module
  In this module the details of the students are managed

- Staff module
  In this module the details of the staff are managed.

- Experiments module
  in this module the details of the experiments are managed.

- Components module
  In this module the details of the components such as test tubes, burettes, conical flasks etc. are managed.

## 4.2 CONTEXT DIAGRAM

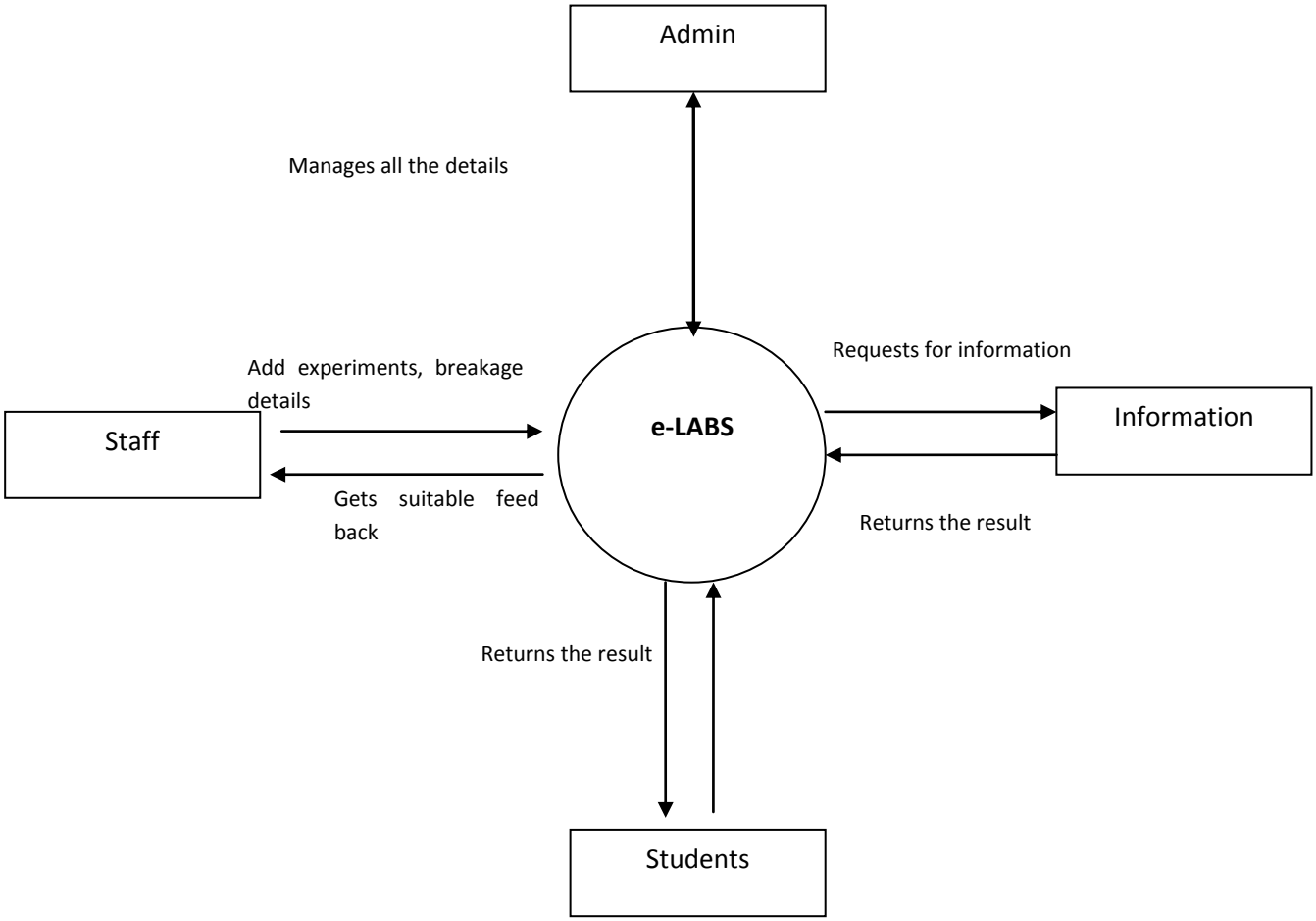


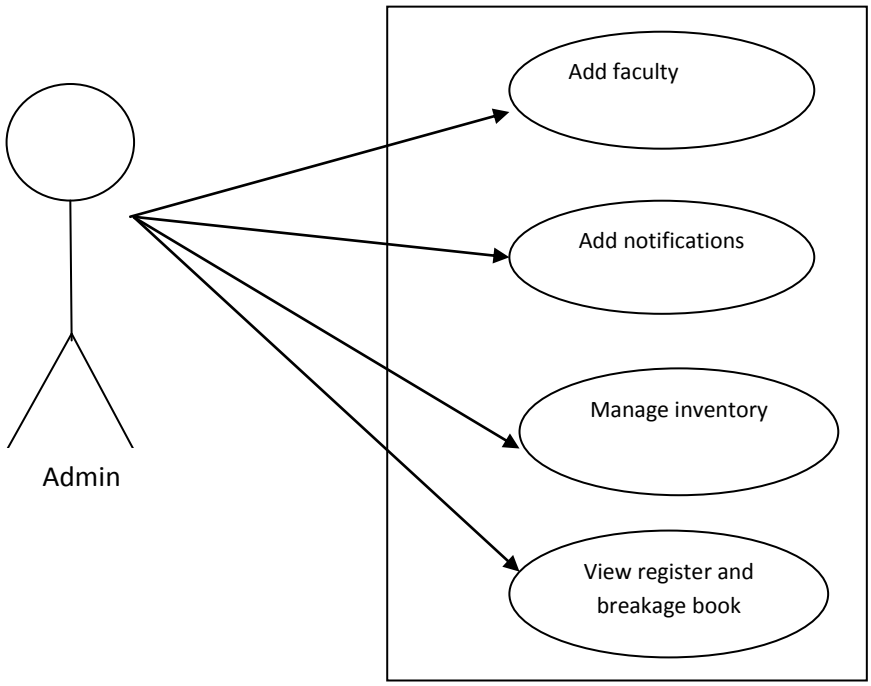

Figure 4.2.1 Context Diagram

**Description:** above diagram shows the various functional units of the project, it allows admin as well as staff's to access the system. Admin has more privileges to manage the database where as staff and students have few privileges.

# 5. DETAILED DESIGN

## 5.1USE CASE DIAGRAMS

**Use case diagram of admin**




**Use case diagram of staff**

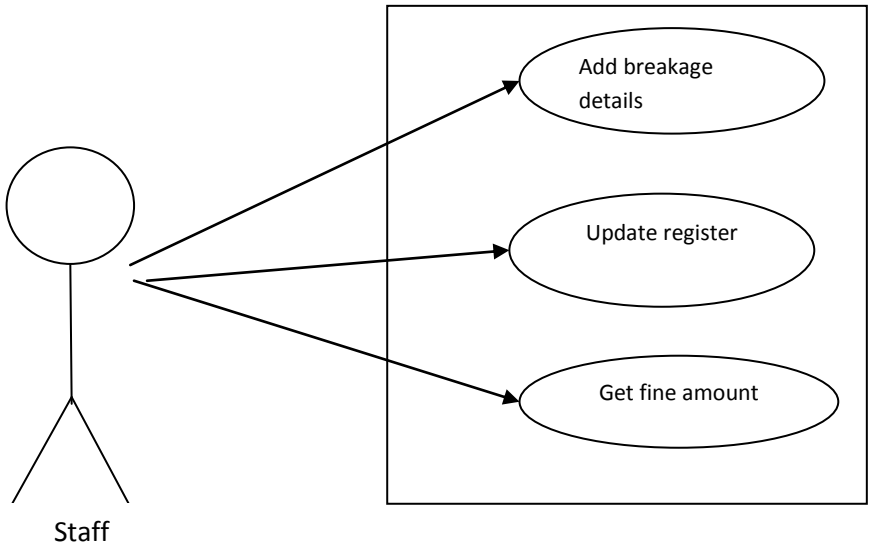



Figure 5.1.1 Use case diagrams

**Description:** above diagram shows the various access privileges being given to the actors of the application.

## 5.2 SEQUENCE DIAGRAM S

Sequence diagram is a model describing how group of objects collaborate in some behavior over time.

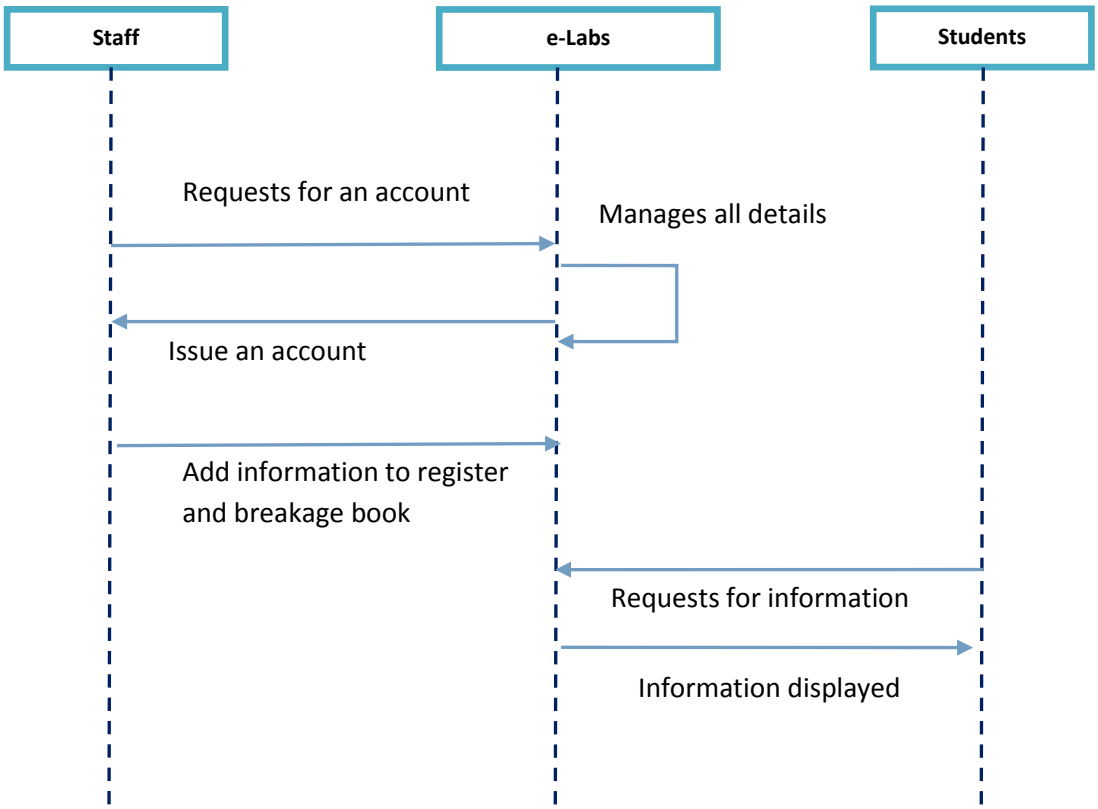



Figure 5.2.1 sequence Diagram

**Description:** Above diagram shows the sequence of actions being done between end users using app and server where the application being hosted.

## 5.3 DATAFLOW DIAGRAMS

Data flow diagram is a graphical representation of flow of data in the system, which can elaborate later.

5.3.1 DFD of admin

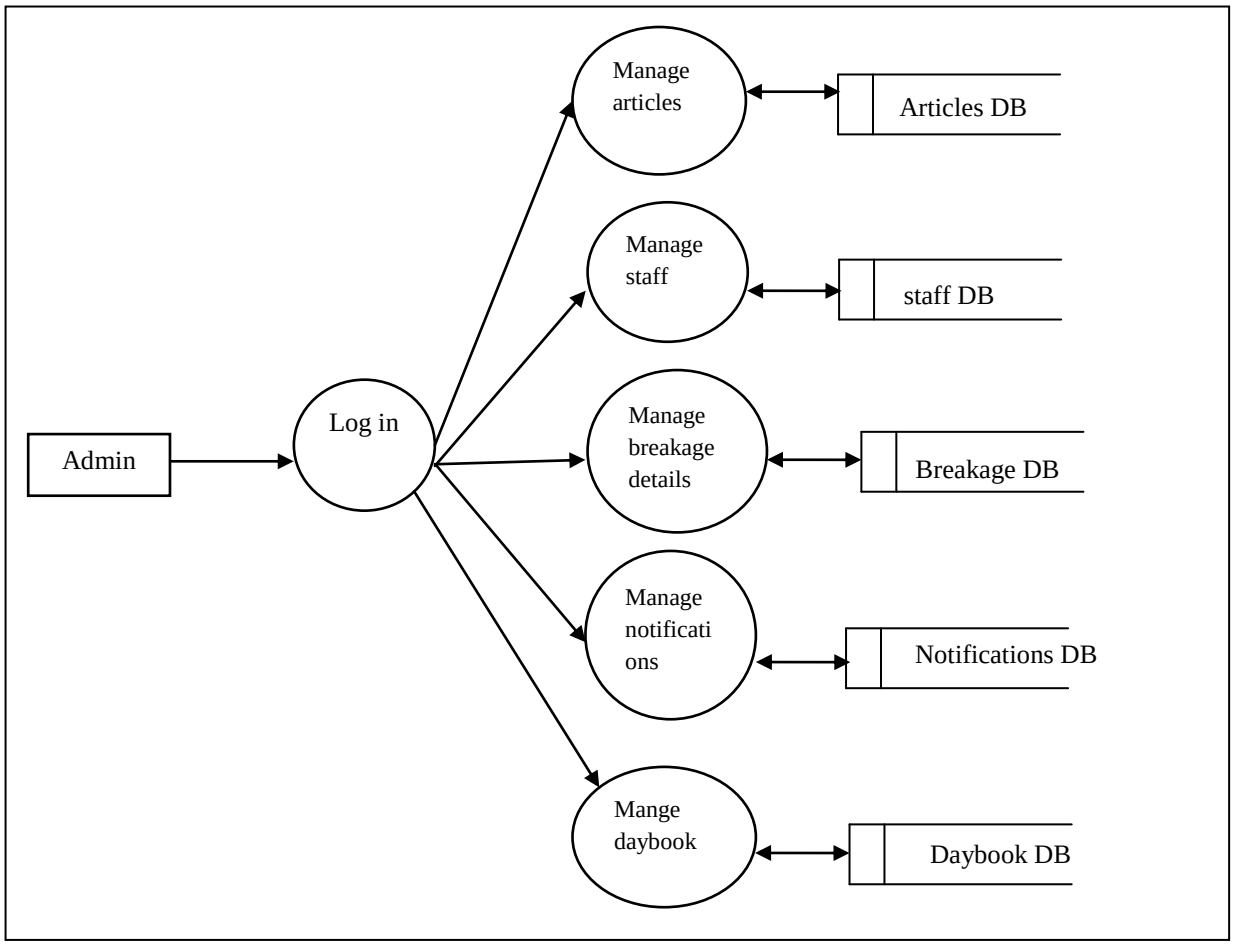



Figure 5.3.1 Dataflow diagram of Admin

**Description:**

Above diagram shows the flow of control for the action's carried out by the actor admin, admin has privileges to manage articles, manage staff, and manage notifications and daybook.

## 5.4 ACTIVITY DIAGRAM

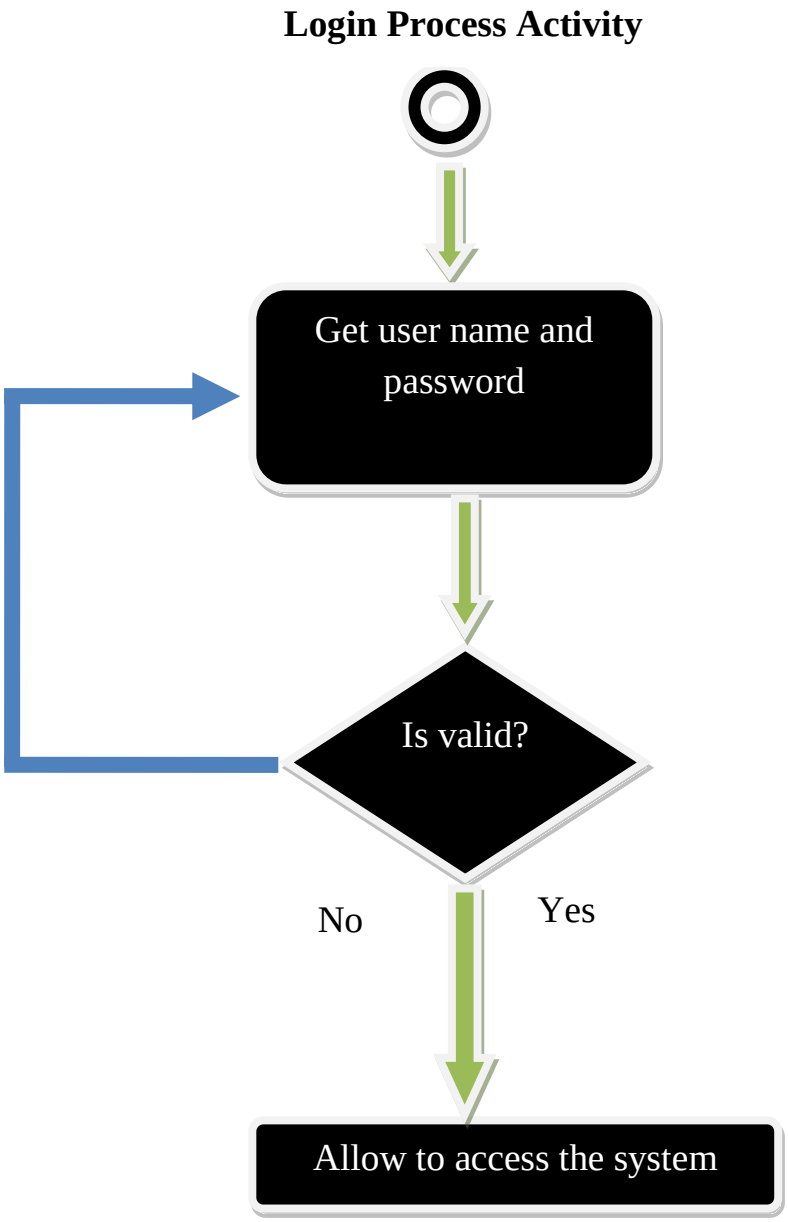



Figure 5.4.1 Activity Diagram

**Description:**

Above diagram shows the login activity of the user, users' needs to give valid user name and password to access the system, if login is successful users are allowed to access the system otherwise an error message is displayed.

## 5.5 DATABASE DESIGN

### 5.5.1 Tables used in the project

**Inventory Table**

| Column | Type |
|---|---|
| Sino | int(11) |
| type | varchar(20) |
| article name | varchar(50) |

This table is used to store details of articles

**Day book table**

| Column | Type |
|---|---|
| Sino | int(5) |
| Dra date | Date |
| name_of_suplier | varchar(50) |
| type_of_supply | varchar(20) |
| Particulars | varchar(50) |
| QTY | int(11) |
| invoice no | varchar(50) |
| Cost | int(11) |
| voucher no | varchar(50) |
| Dop | Date |
| Remarks | varchar(50) |

**Breakage table**

| Column | Type |
|---|---|
| Sino | int(11) |
| tdate | Date |
| same | varchar(30) |
| regno | varchar(20) |
| sem | varchar(10) |
| laname | varchar(30) |
| article | varchar(20) |
| qty | int(11) |
| amt | int(11) |
| recptno | varchar(20) |
| recvrydate | Date |
| remarks | varchar(50) |

This table is used to store breakage details

**Staff table**

| Column | Type |
|---|---|
| Sino | int(11) |
| Fname | varchar(100) |
| Lname | varchar(100) |
| Uname | varchar(20) |
| Pwd | varchar(100) |

This table is used to store details of staff

**Register book table**

| Column | Type |
|---|---|
| sino | int(10) |
| sem | varchar(10) |
| edate | Date |
| time | Time |
| batchno | varchar(10) |
| lname | varchar(30) |
| aname | varchar(30) |
| expname | varchar(50) |
| components | varchar(50) |

This table is used to store details of experiments conducted

**Documents table**

| Column | Type |
|---|---|
| sino | int(11) |
| caption | varchar(100) |
| filename | varchar(200) |

This table is used to store details of documents uploaded by user

**Videos table**

| Column | Type |
|---|---|
| sino | int(11) |
| caption | varchar(100) |
| filename | varchar(200) |

This table is used to store details of videos being uploaded

**Notifications table**

| Column | Type |
|---|---|
| ndate | Date |
| sino | int(11) |
| caption | varchar(100) |
| descr | Text |

This table is used to store details of notifications

### 5.5.2 ER diagram

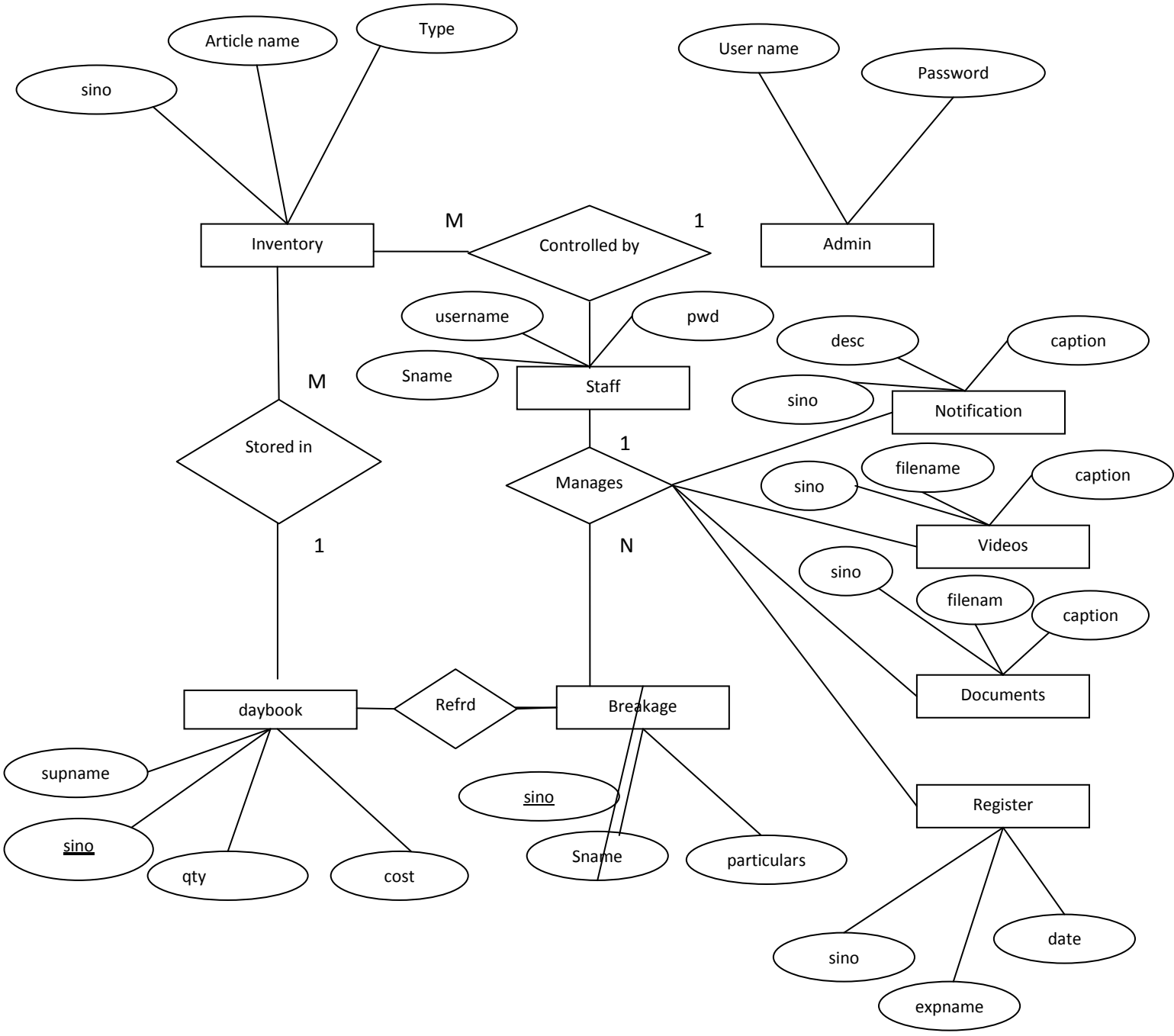
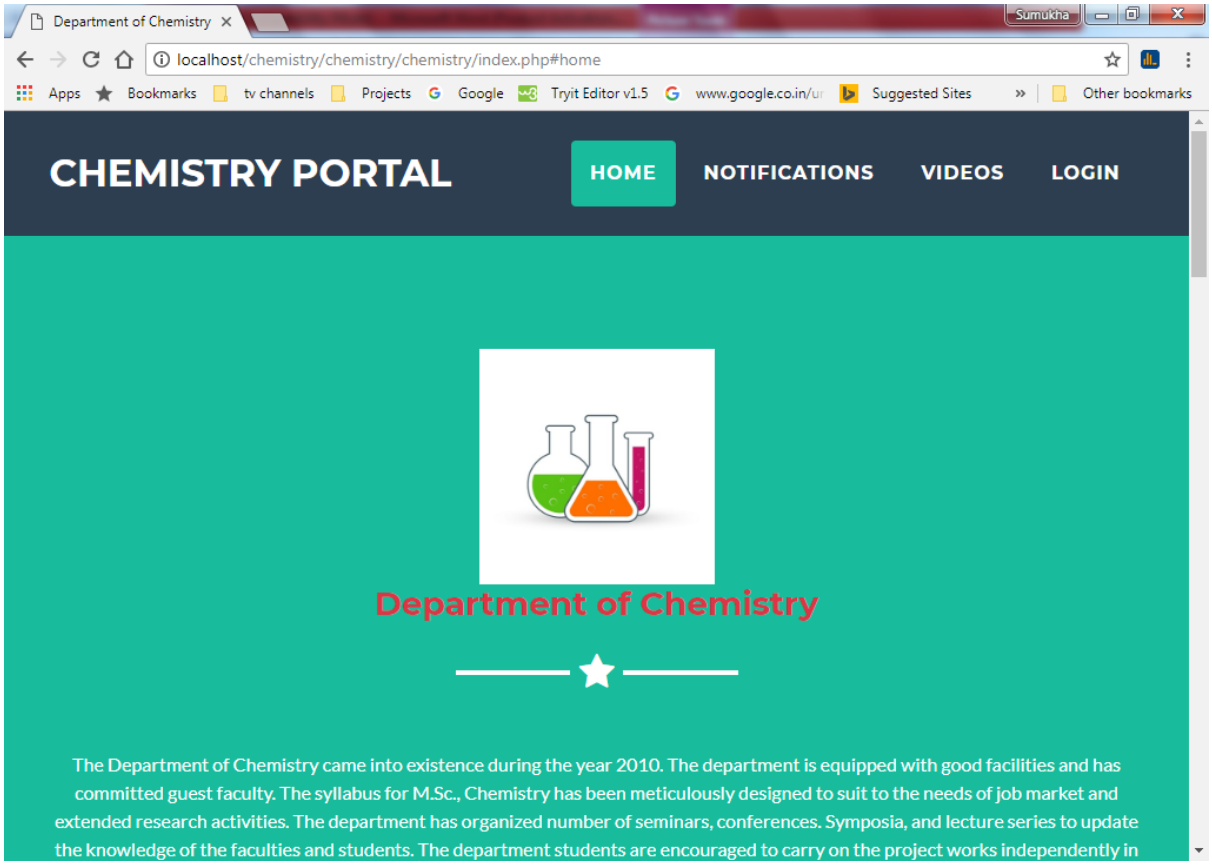



Figure 5.5.2 ER diagram of project

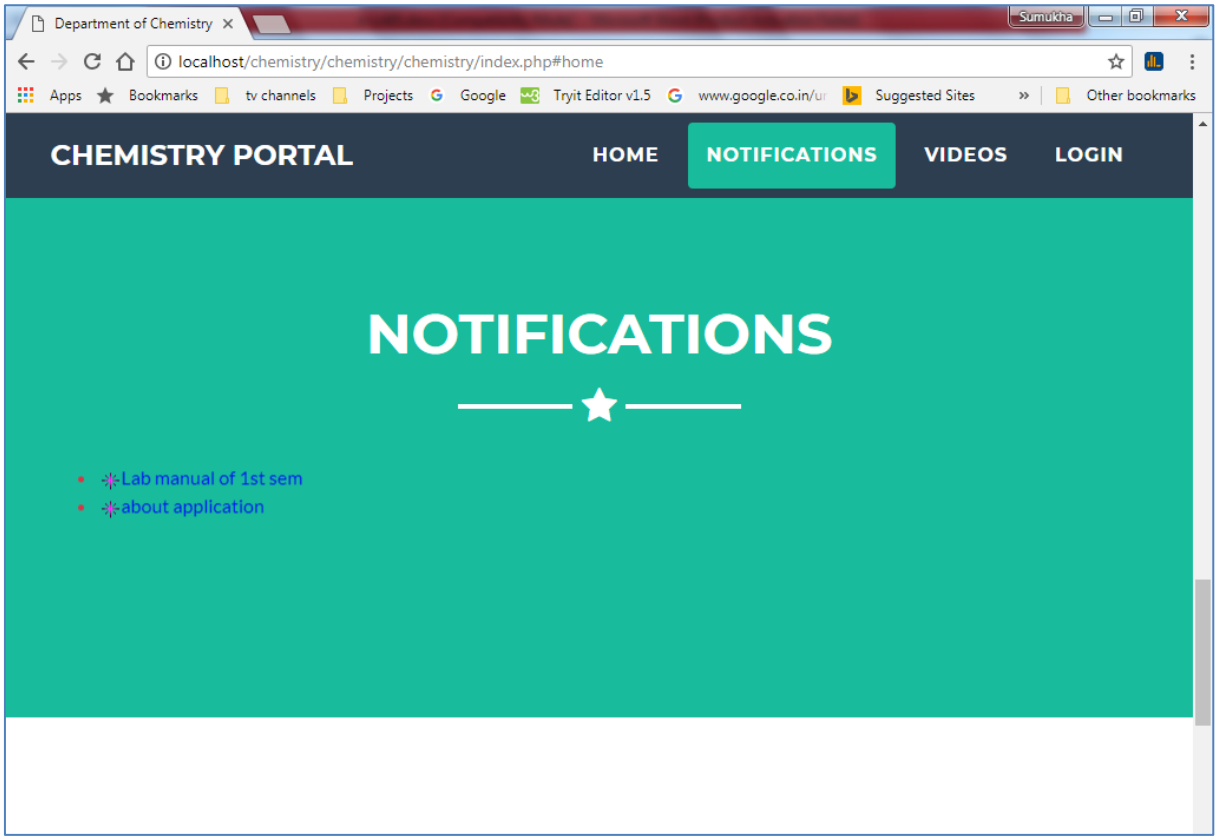
# 6. **IMPLEMENTATION**

## 6.1 SCREEN SHOTS

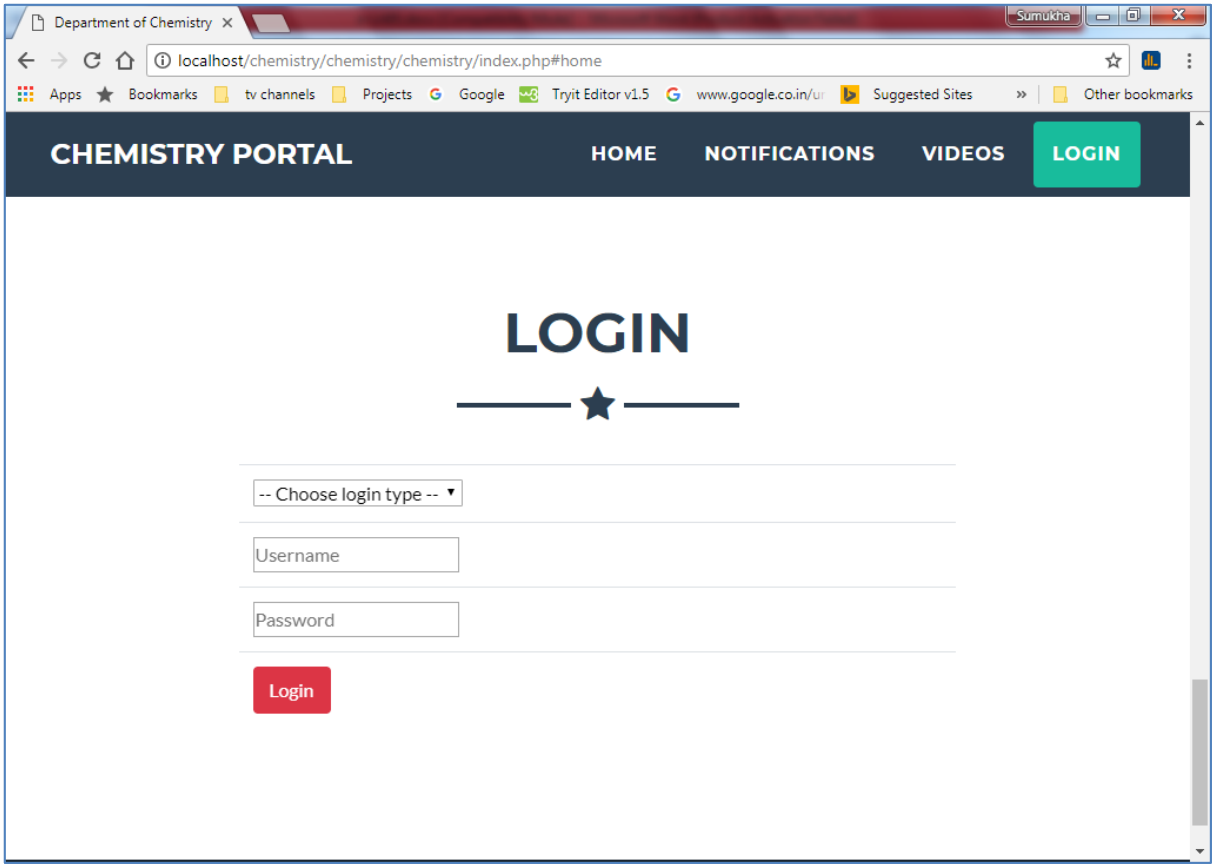
### Home page



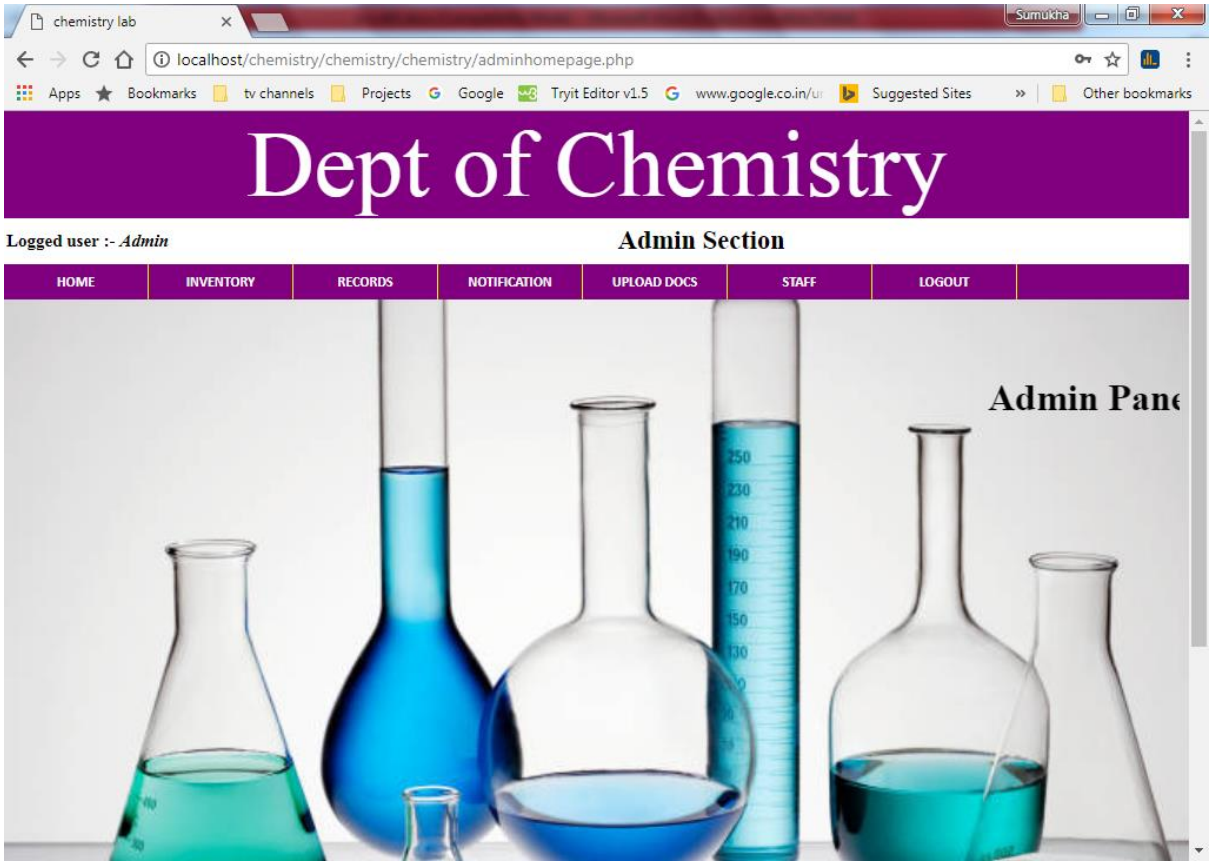
Notifications form



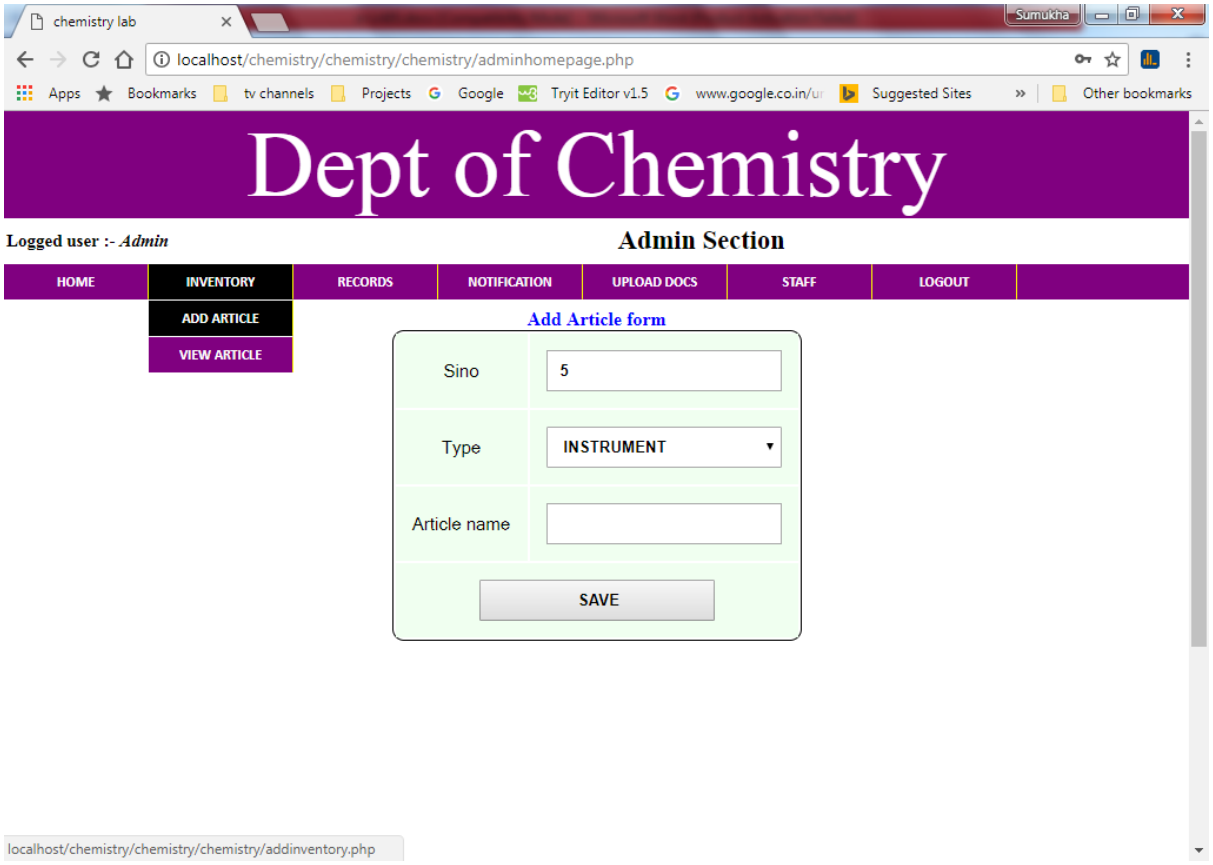
Login form


Department of Chemistry
Sumukha
localhost/chemistry/chemistry/chemistry/index.php#home
Apps
Bookmarks
tv channels
Projects
Google
Tryit Editor v1.5
www.google.co.in/ur
Suggested Sites
Other bookmarks
CHEMISTRY PORTAL
HOME
NOTIFICATIONS
VIDEOS
LOGIN
LOGIN
-- Choose login type --
Username
Password
Login

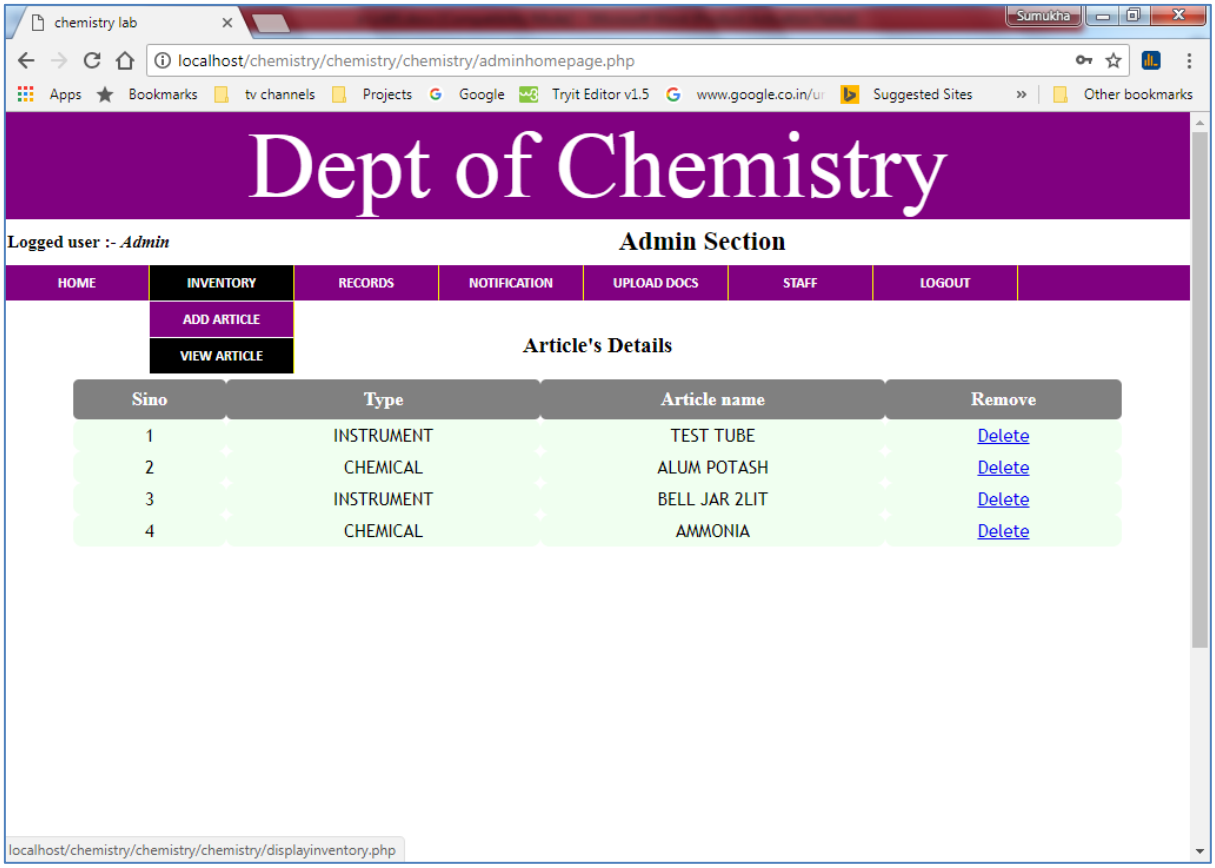
Admin home page



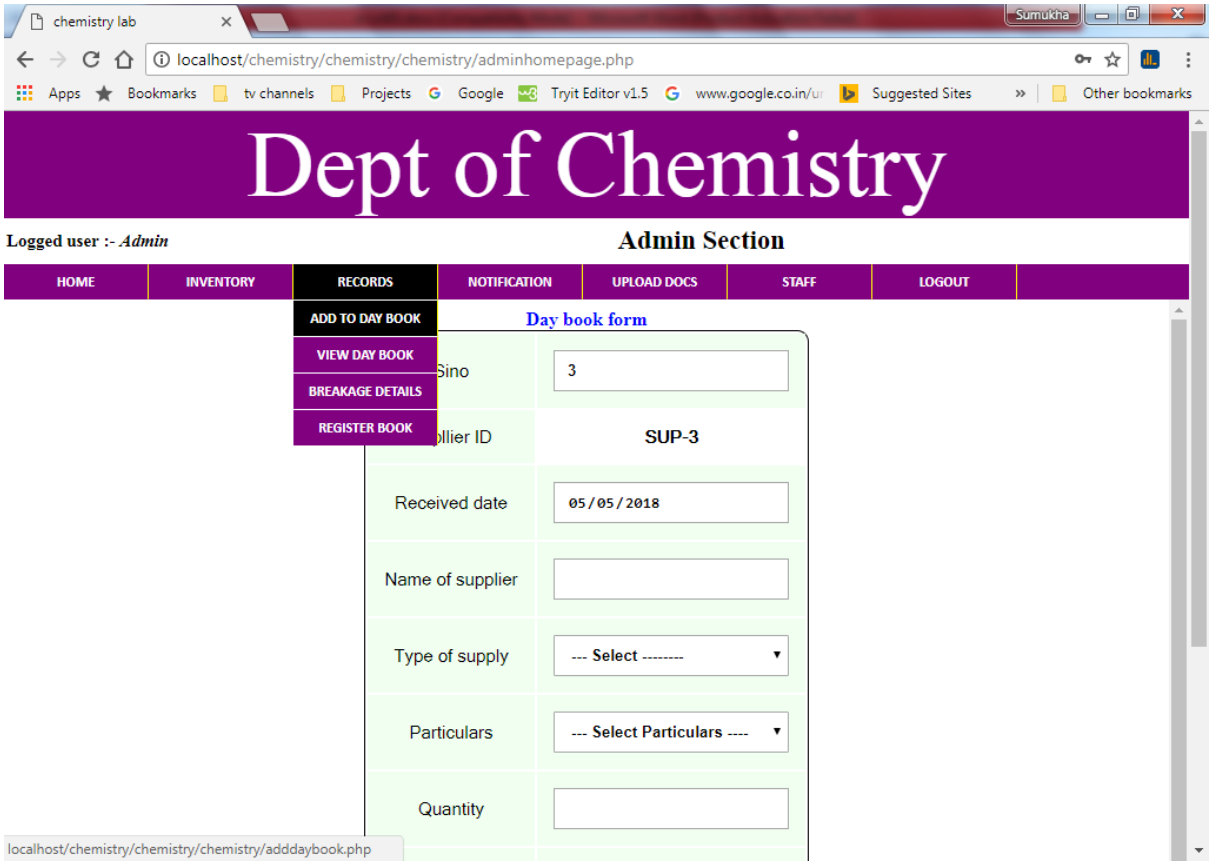
# Add new article form



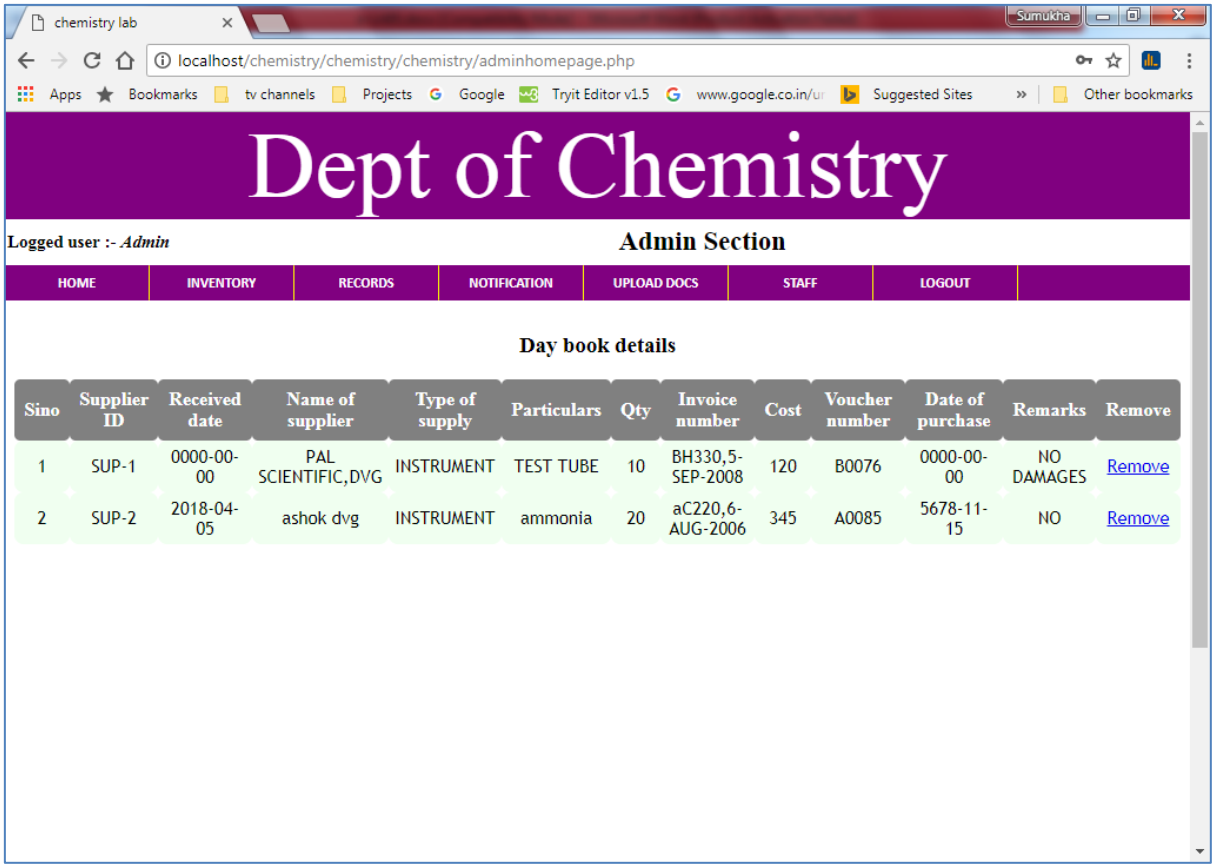
View articles form



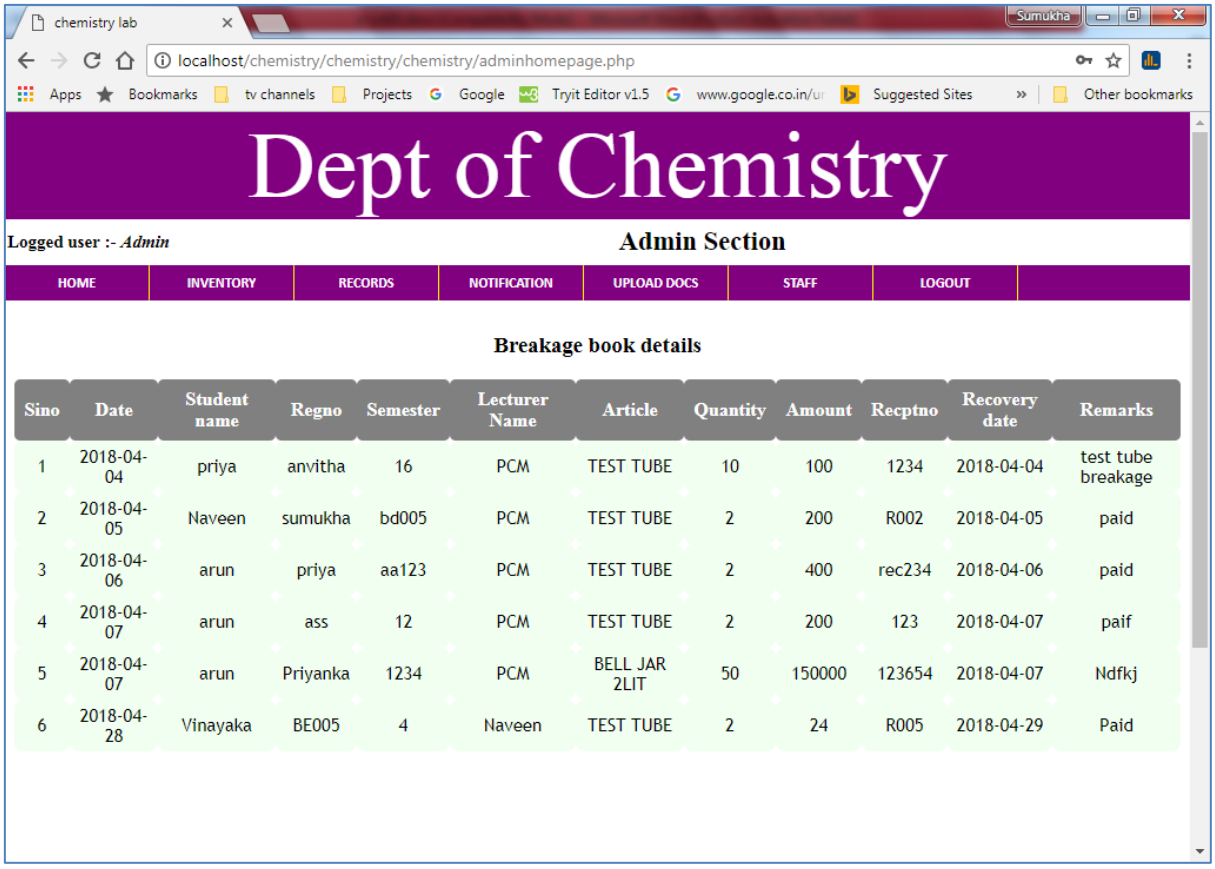
# Add day book form



# Daybook details form

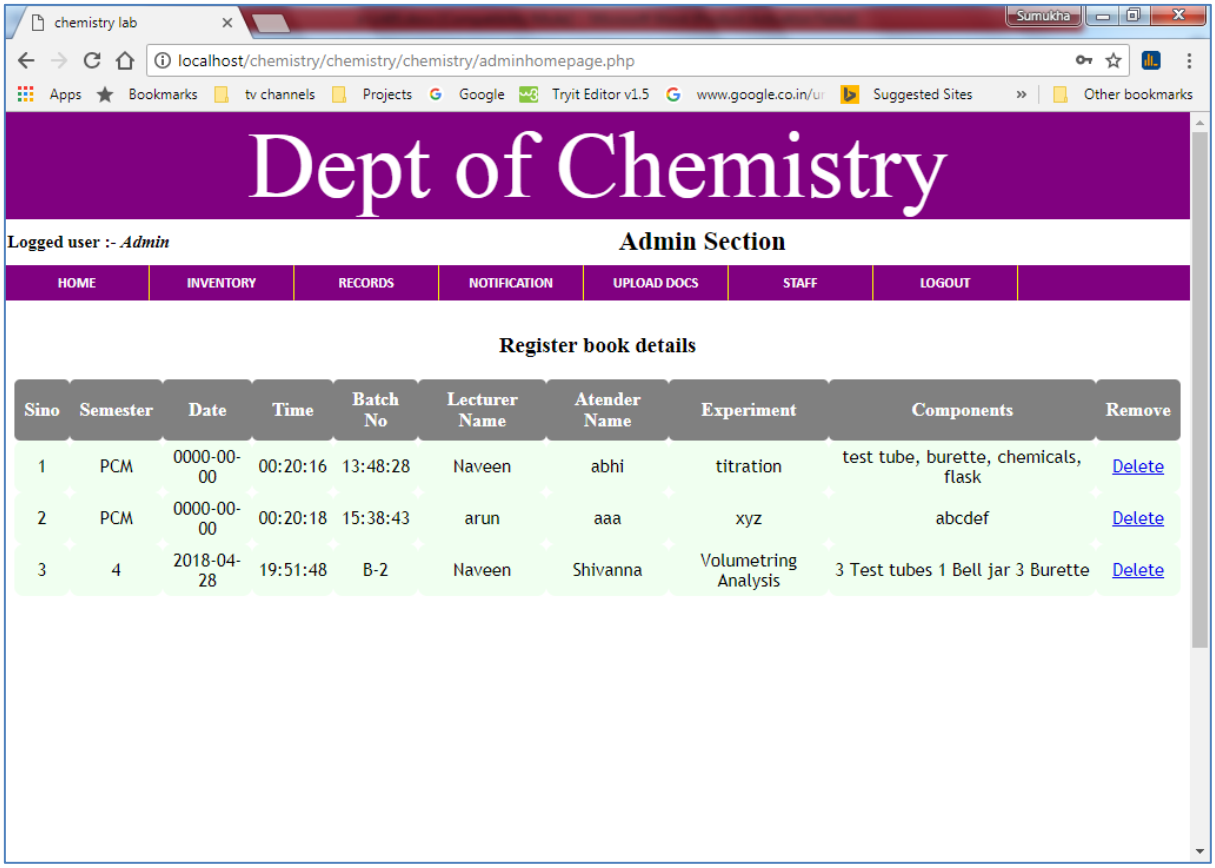


# Breakage details form

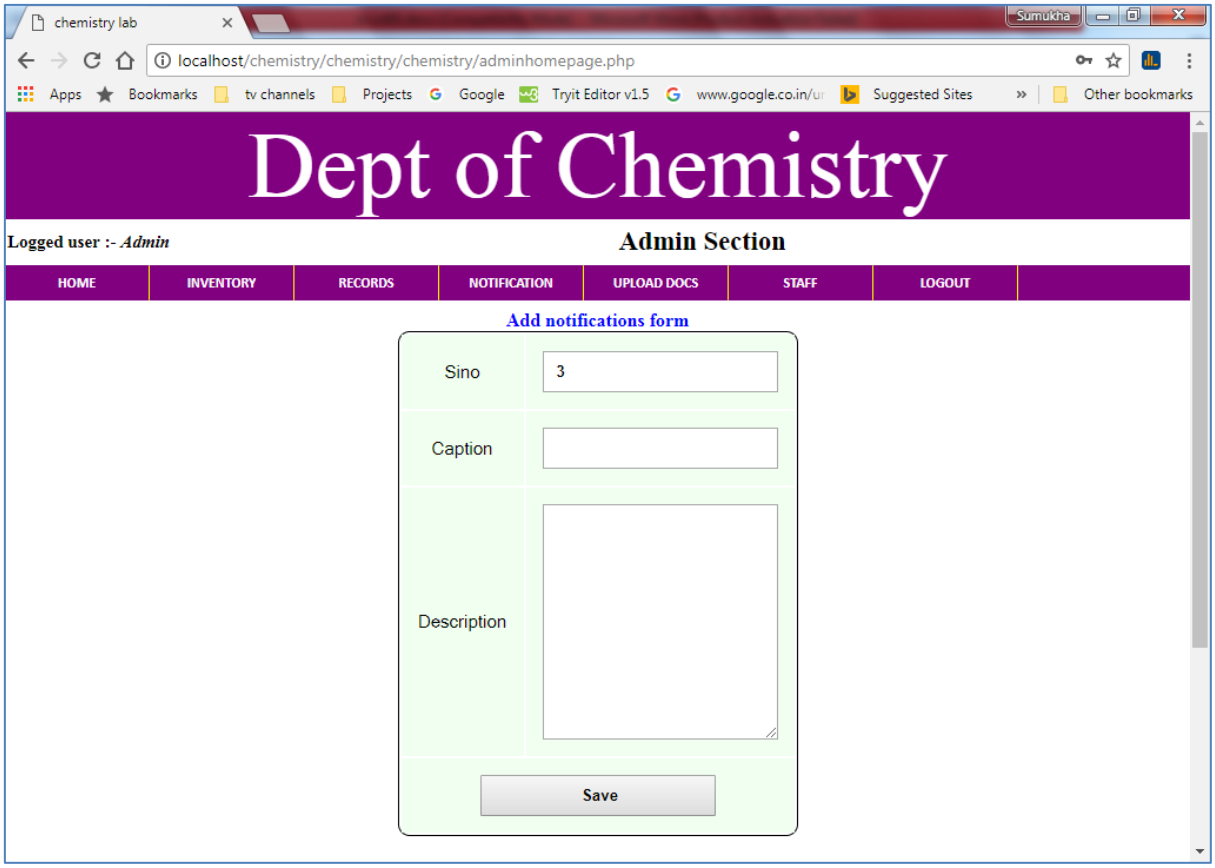



| Sino | Date | Student name | Regno | Semester | Lecturer Name | Article | Quantity | Amount | Recptno | Recovery date | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2018-04-04 | priya | anvitha | 16 | PCM | TEST TUBE | 10 | 100 | 1234 | 2018-04-04 | test tube breakage |
| 2 | 2018-04-05 | Naveen | sumukha | bd005 | PCM | TEST TUBE | 2 | 200 | R002 | 2018-04-05 | paid |
| 3 | 2018-04-06 | arun | priya | aa123 | PCM | TEST TUBE | 2 | 400 | rec234 | 2018-04-06 | paid |
| 4 | 2018-04-07 | arun | ass | 12 | PCM | TEST TUBE | 2 | 200 | 123 | 2018-04-07 | paif |
| 5 | 2018-04-07 | arun | Priyanka | 1234 | PCM | BELL JAR 2LIT | 50 | 150000 | 123654 | 2018-04-07 | Ndfkj |
| 6 | 2018-04-28 | Vinayaka | BE005 | 4 | Naveen | TEST TUBE | 2 | 24 | R005 | 2018-04-29 | Paid |

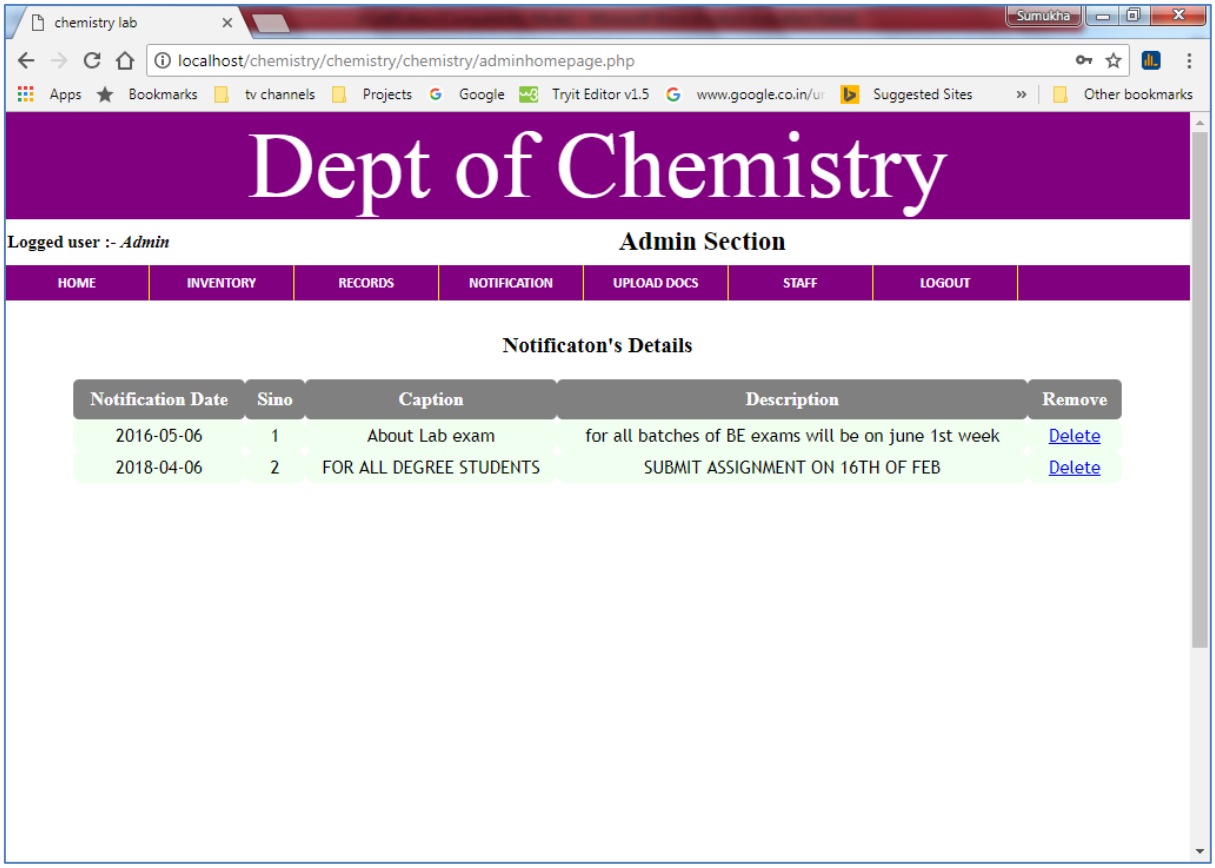
# Register book details form



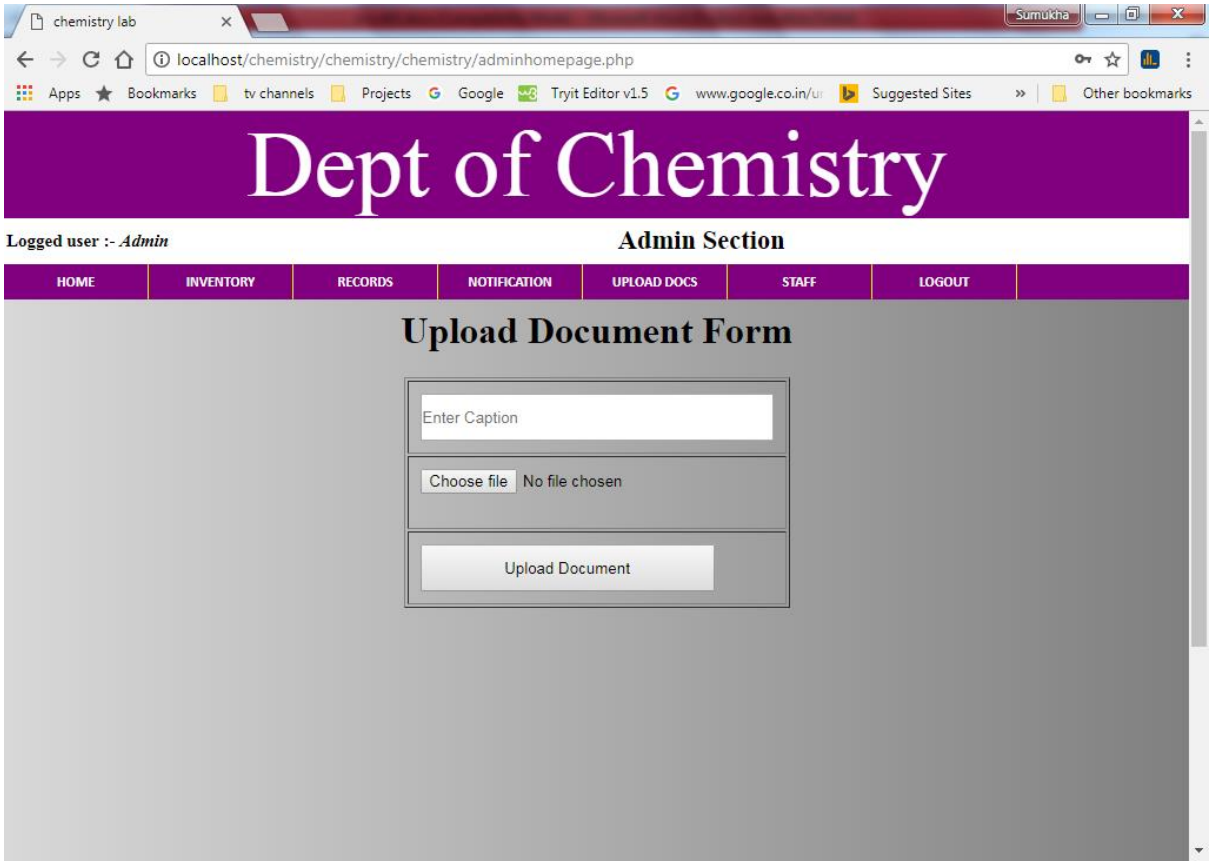
# Add notifications form



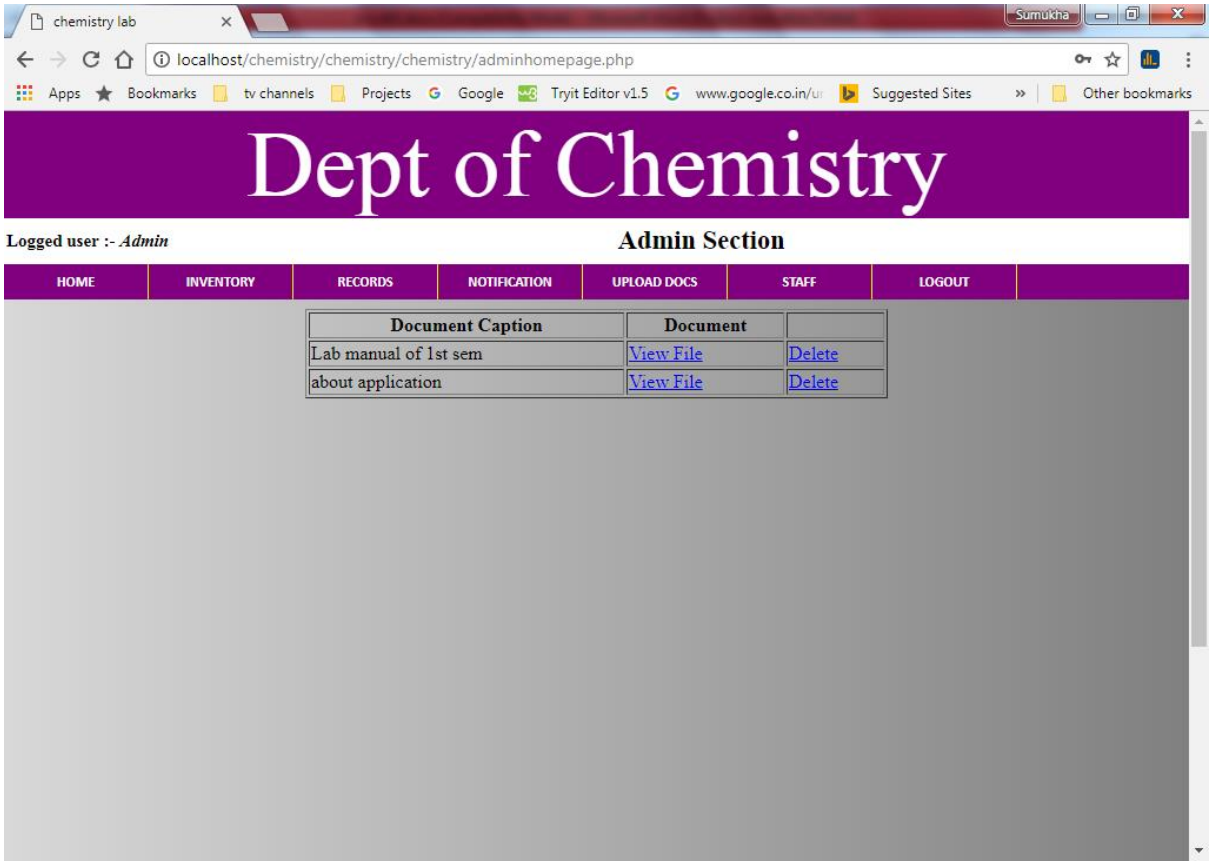
# Notification details form



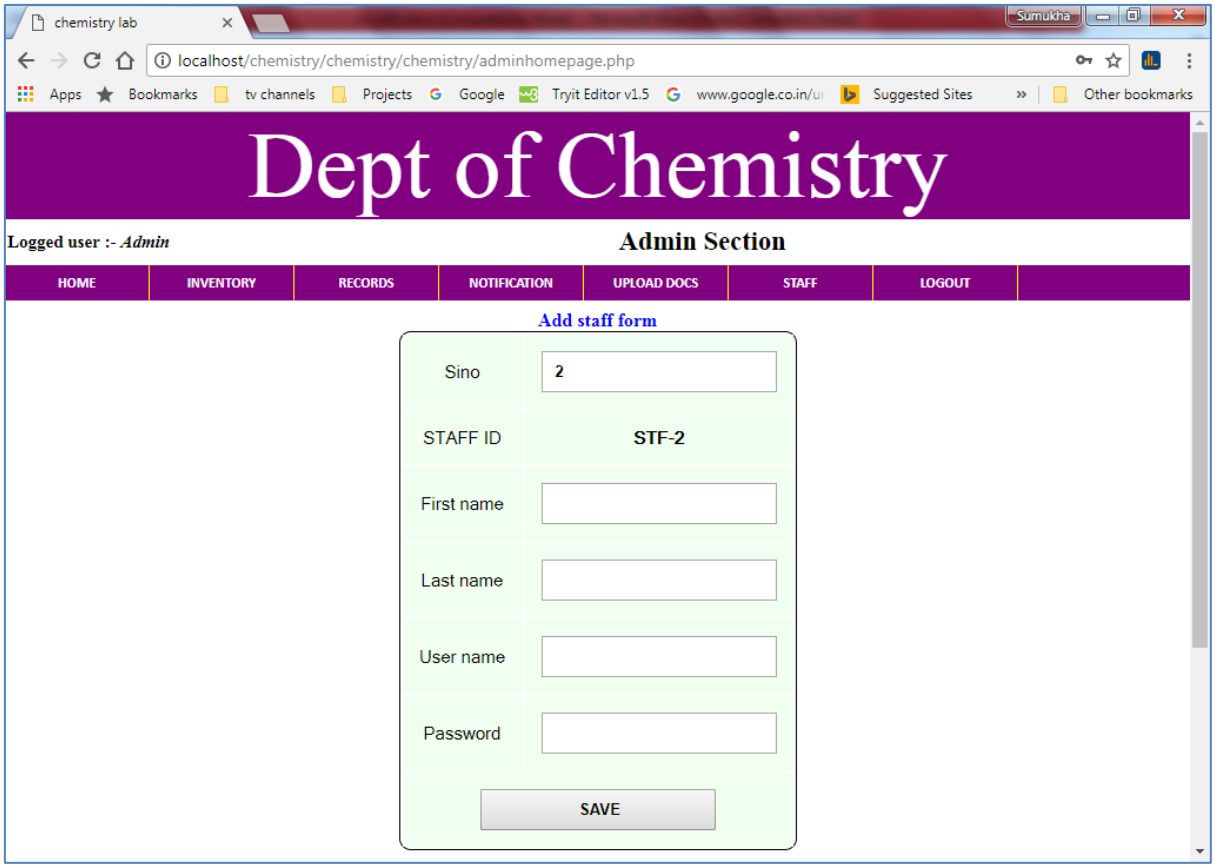
Form used to upload docs



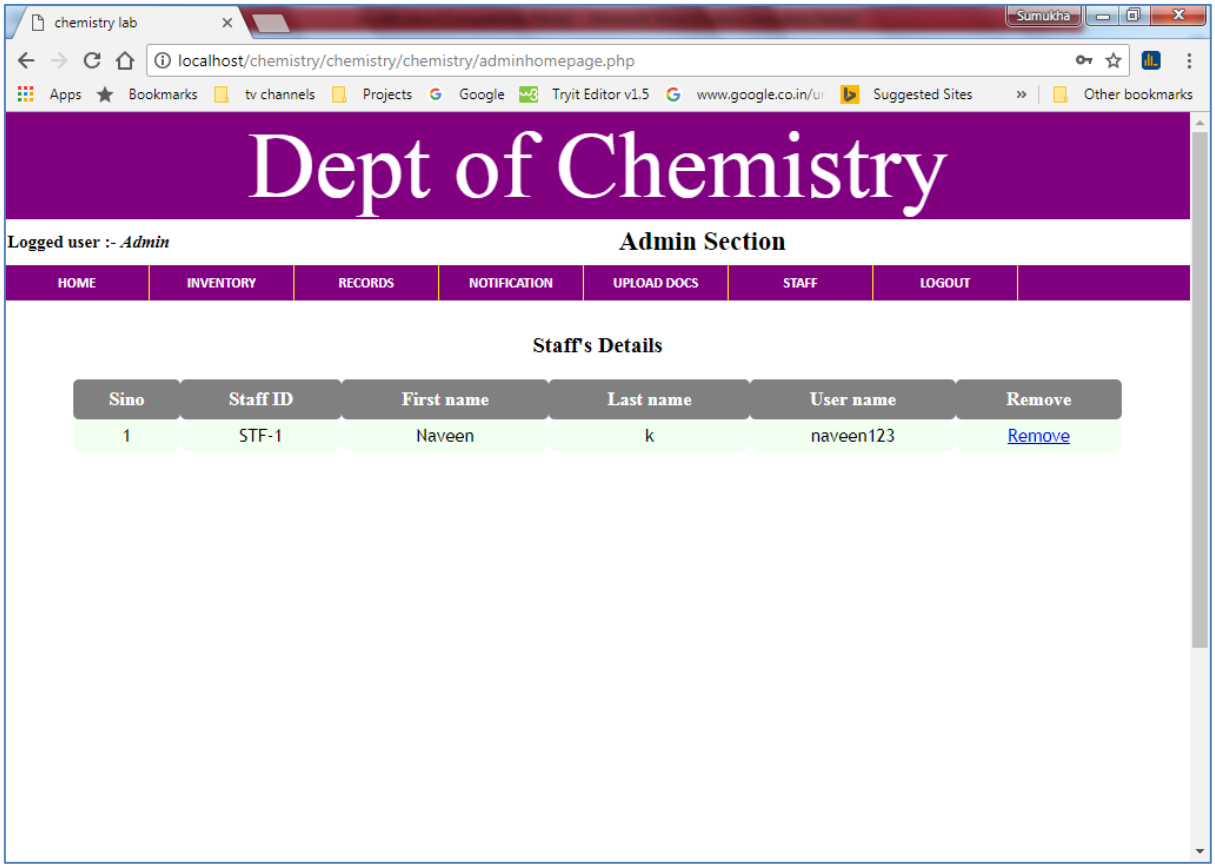
Document details form



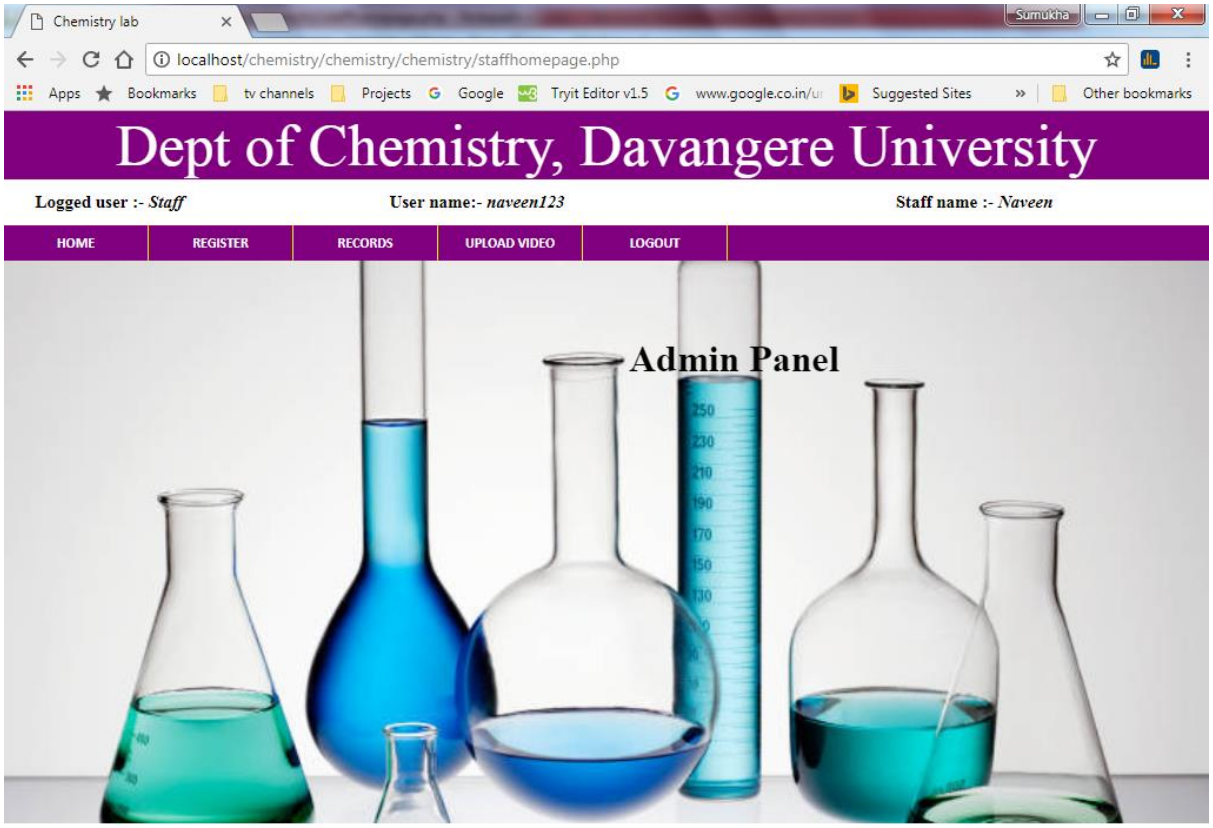
# Add new staff form



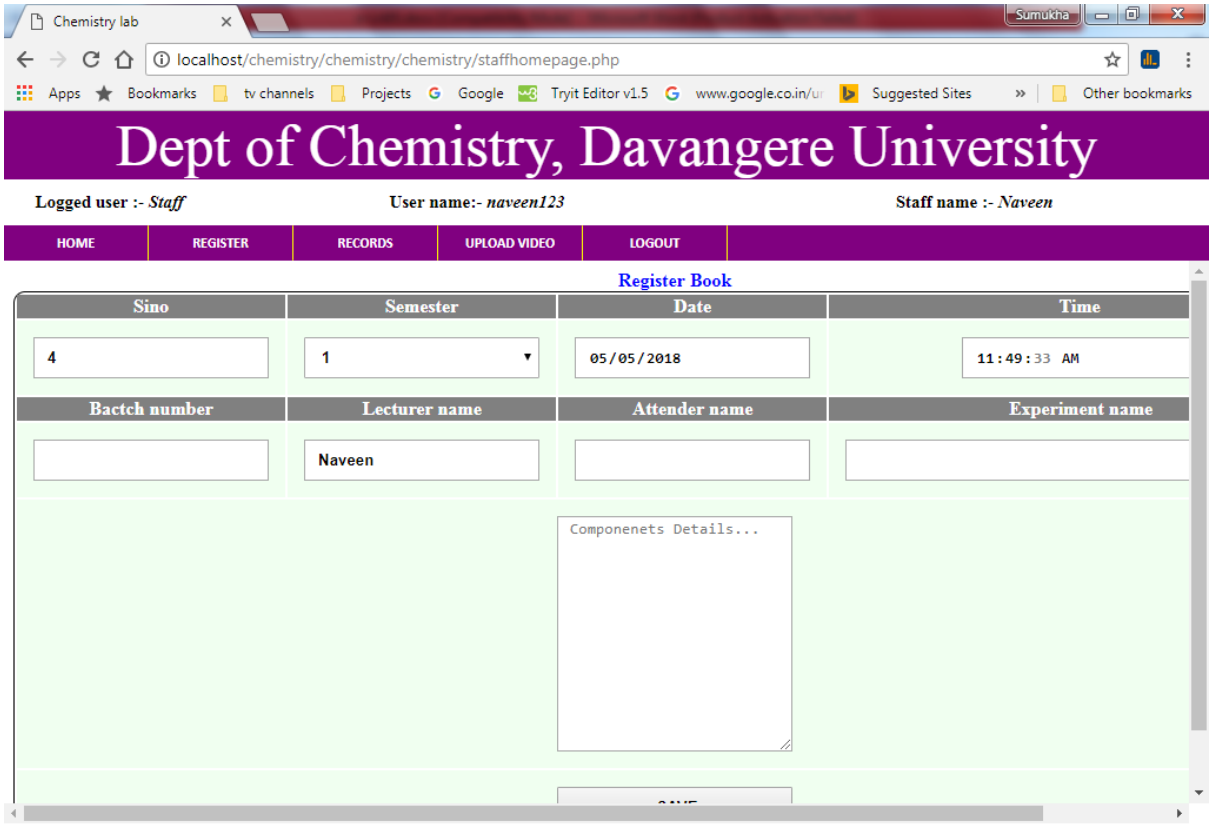
Staff's details form



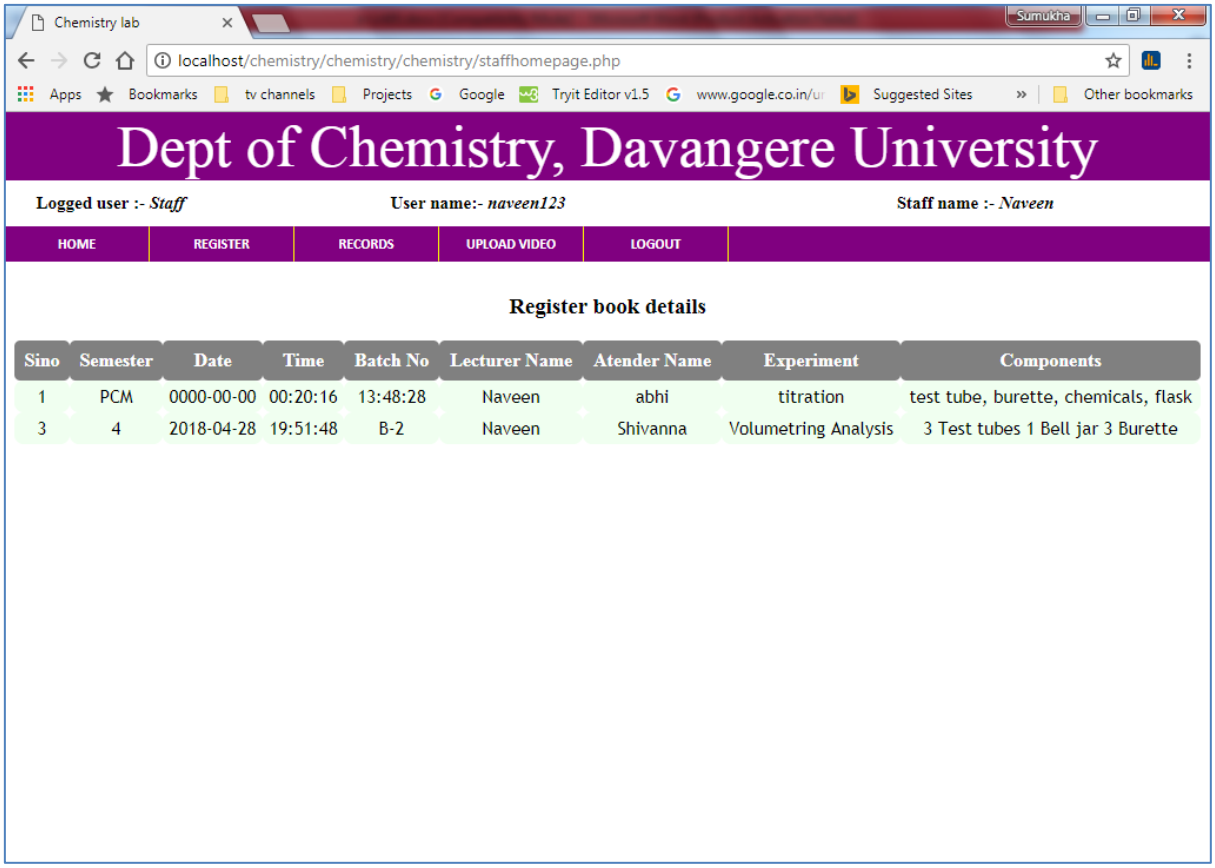
Admin home page



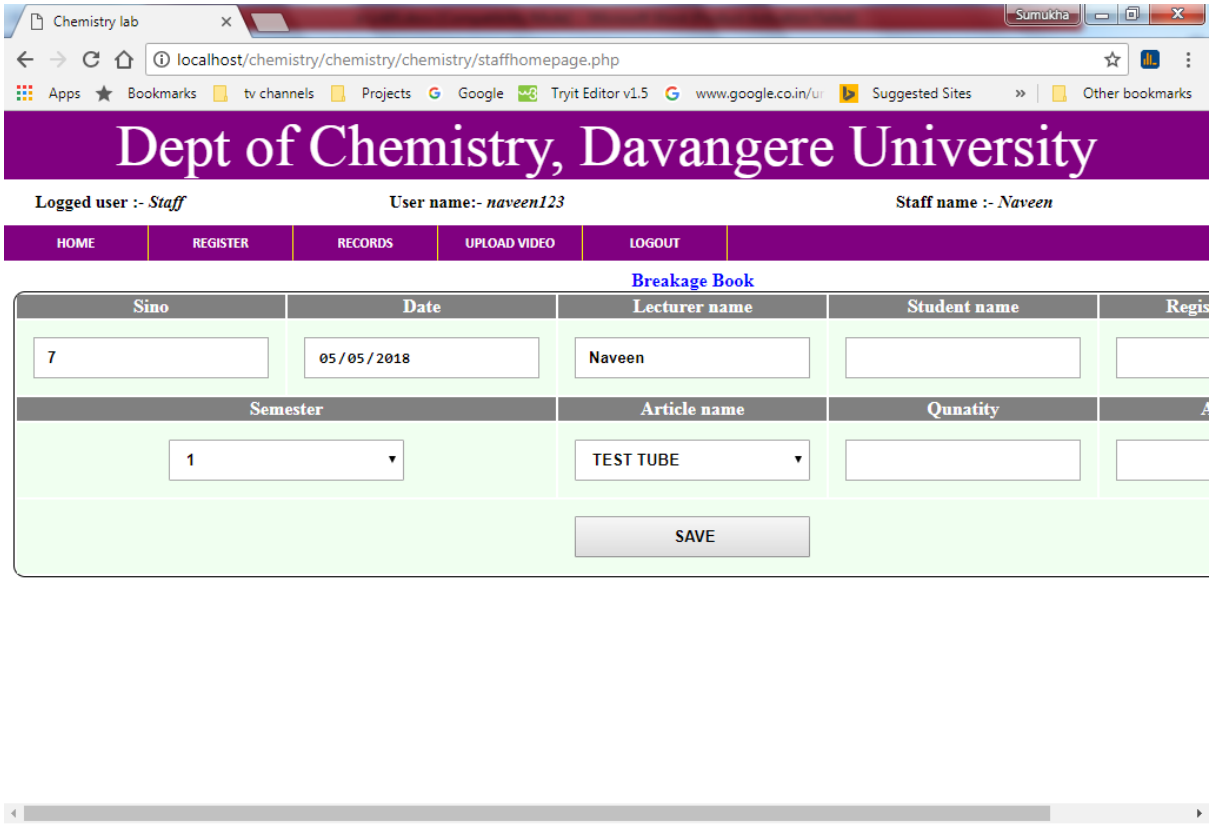
# Register book form



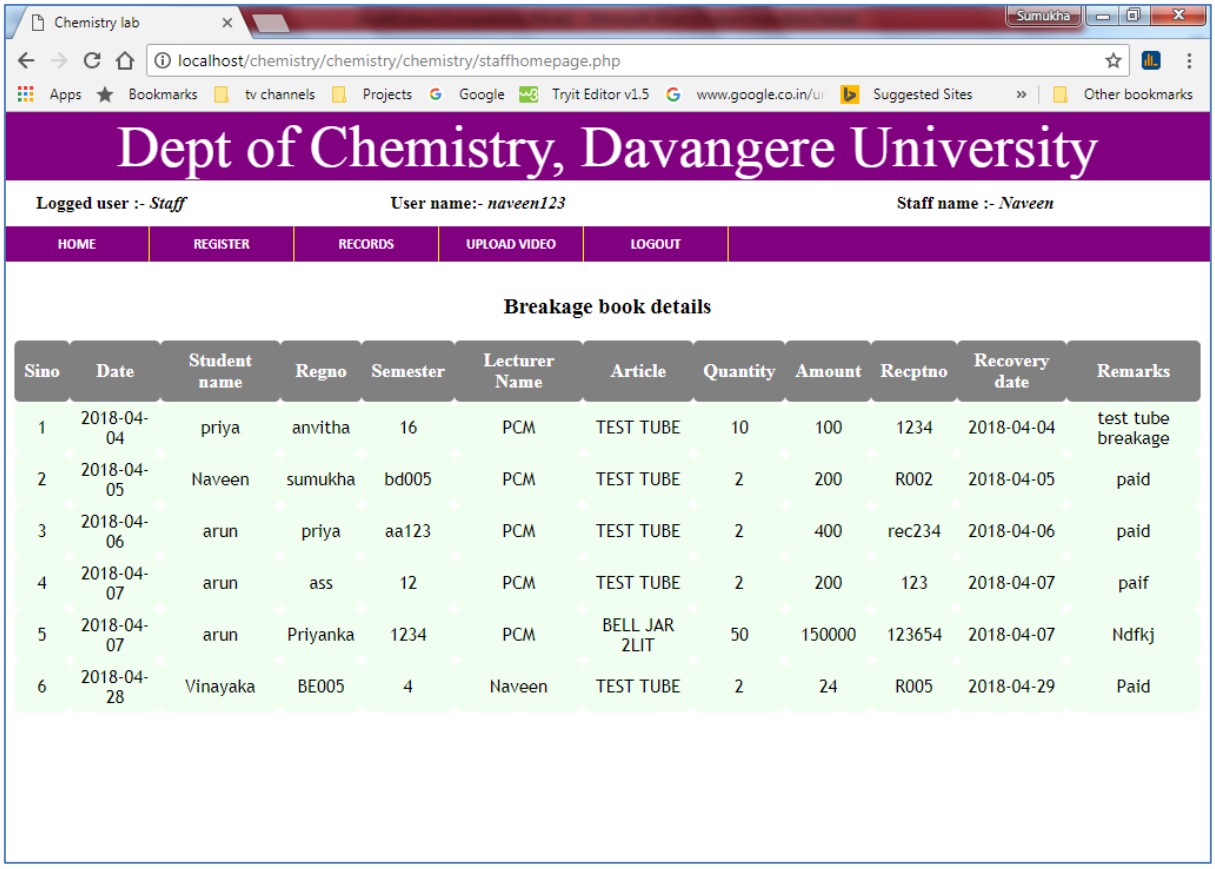
# Register book details form



Form used to add breakage details form

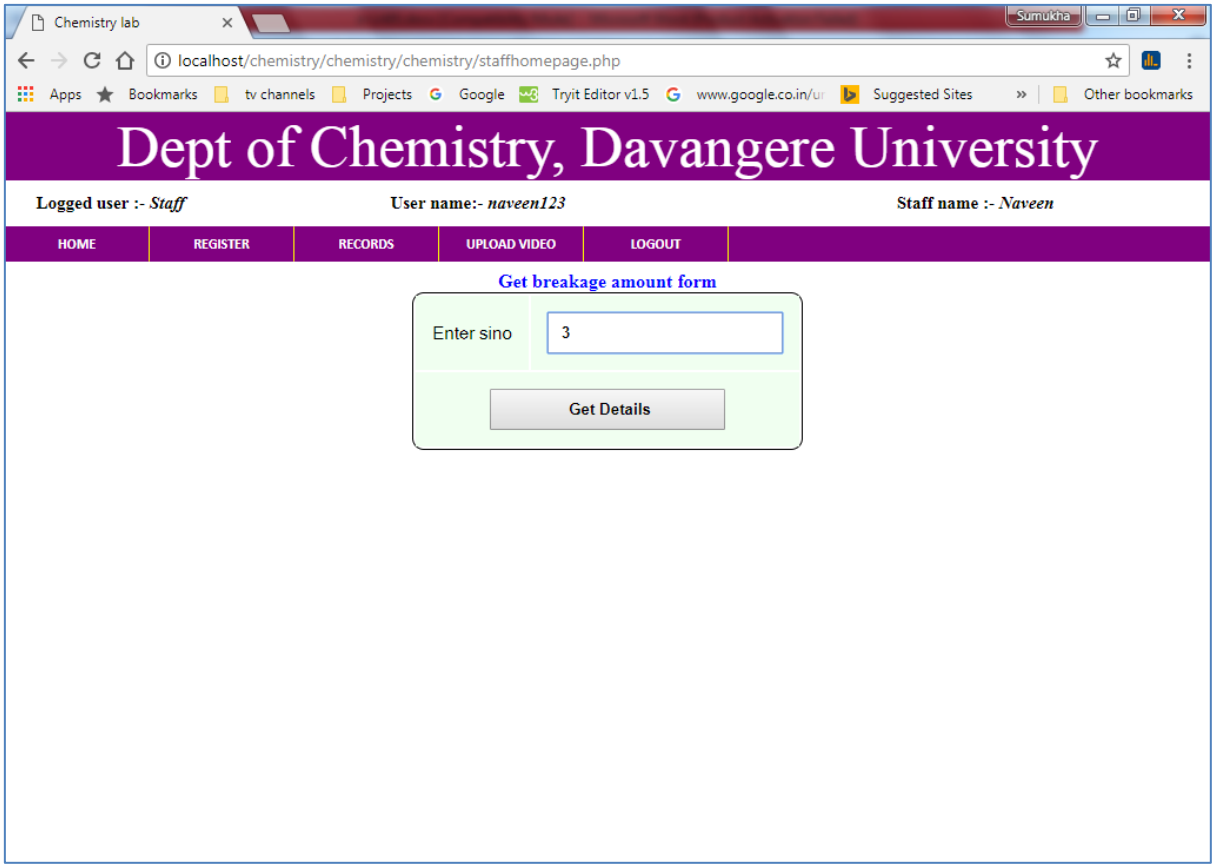


# Breakage details form

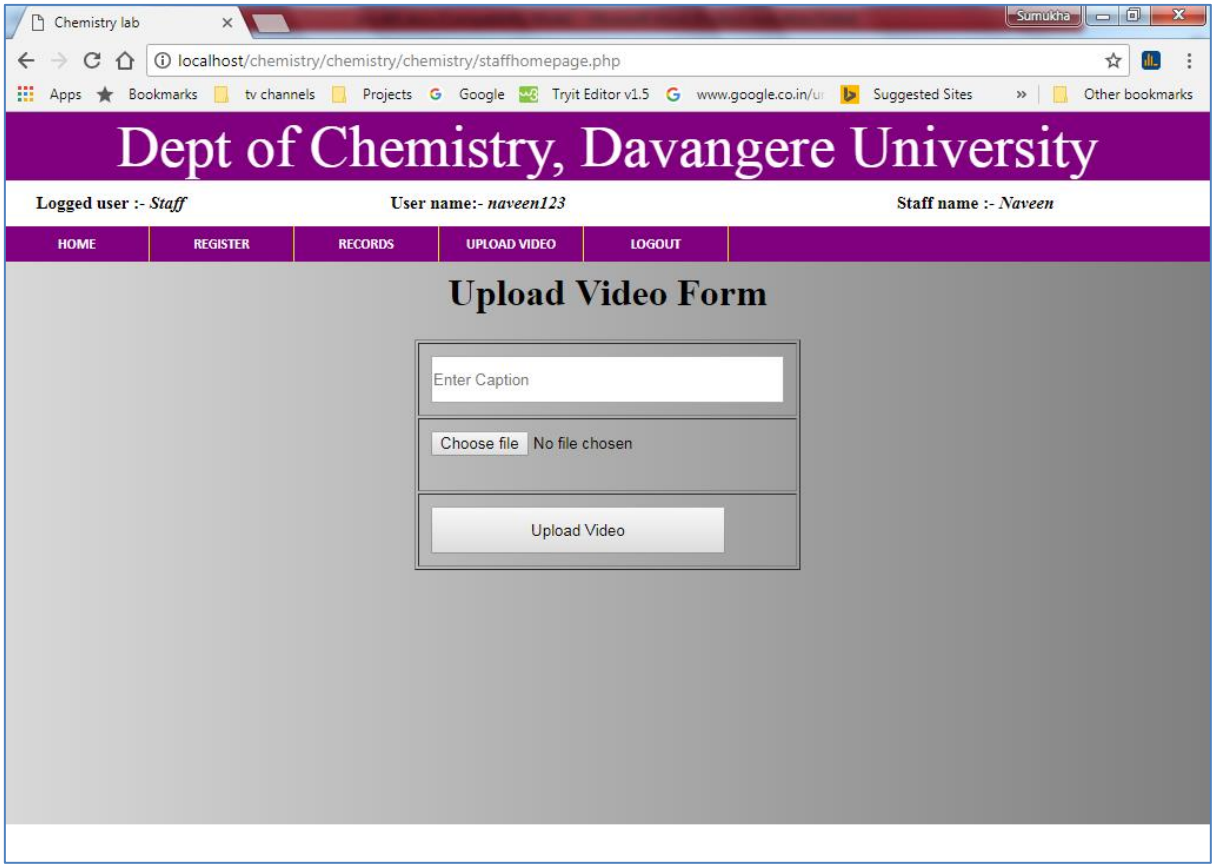



| Sino | Date | Student name | Regno | Semester | Lecturer Name | Article | Quantity | Amount | Recptno | Recovery date | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2018-04-04 | priya | anvitha | 16 | PCM | TEST TUBE | 10 | 100 | 1234 | 2018-04-04 | test tube breakage |
| 2 | 2018-04-05 | Naveen | sumukha | bd005 | PCM | TEST TUBE | 2 | 200 | R002 | 2018-04-05 | paid |
| 3 | 2018-04-06 | arun | priya | aa123 | PCM | TEST TUBE | 2 | 400 | rec234 | 2018-04-06 | paid |
| 4 | 2018-04-07 | arun | ass | 12 | PCM | TEST TUBE | 2 | 200 | 123 | 2018-04-07 | paif |
| 5 | 2018-04-07 | arun | Priyanka | 1234 | PCM | BELL JAR 2LIT | 50 | 150000 | 123654 | 2018-04-07 | Ndfkj |
| 6 | 2018-04-28 | Vinayaka | BE005 | 4 | Naveen | TEST TUBE | 2 | 24 | R005 | 2018-04-29 | Paid |

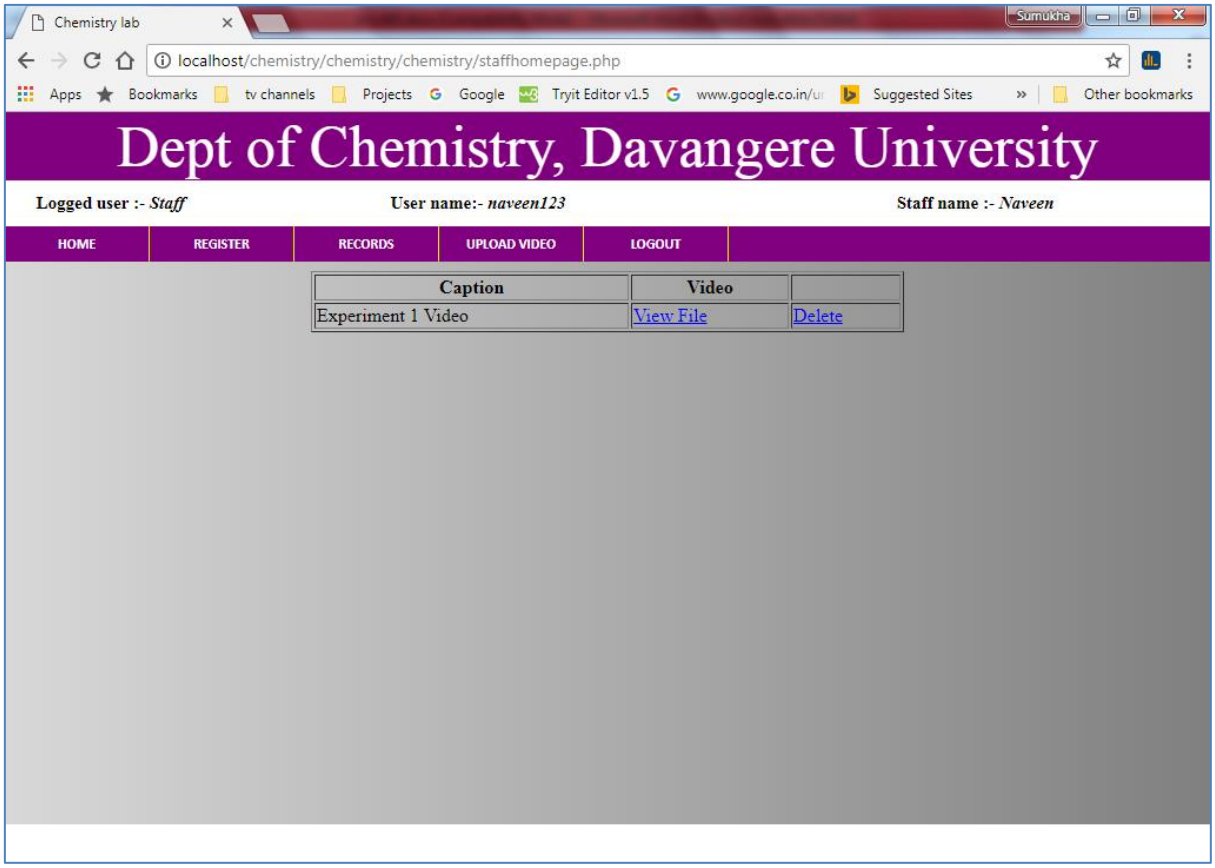
Form used to get breakage amount



Video upload form



Form showing uploaded video details



# 7. SOFTWARE TESTING

## 7.1 TEST CASES

**Admin Login**

| Input | Output | conclusion |
|---|---|---|
| 1. User name: user input<br>2. Password: user input | Either users are allowed to access the system or an error message is displayed | admin needs to have an account to access the system, they are allowed to acess the system only after successful login |

**Creating an account**

| Input | Output | conclusion |
|---|---|---|
| 1. First name : user input<br>2. Last name : user input<br>3. Contact number : user input<br>4. Address : user input<br>5. User name : user input<br>6. Password : user input | Record is saved to database if all fields are filled and user name is unique | Admin has rights create an account for the staff |

**Add notification**

| Input | Output | conclusion |
|---|---|---|
| 1. Sino : auto generated<br>2. Caption: user input<br>3. Description : user input<br>4. File : user input | Record is saved to database if all fields are filled except except the last filed | admin could display notification's on home page |

# 8. CONCLUSION

The project entitled “e-LABS” is an application software which finds useful in organizations such as colleges or universities where experiments are conducted in the laboratory. Using this package all the transactions carried out in the chemistry lab can be managed.

Usually the chemicals and equipment’s are stored in the store room if there exists more than one lab in a college then each will have its own store room here we have not considered such criteria here we are managing the records of a single store room and at the yearend we need balance sheet which sorts out the details of equipment’s purchased and expenditure amount here we have not included such facility.

This project could be used in colleges or universities to manage the transactions related to chemistry lab easily and effectively.

# 9. FUTURE ENHANCEMENT

Future enhancement is a section that contains ideas and views that have to implement in the future to update the proposed project this provides some more features to users.

- Product could be made all browser compatible
- Encryption technique could be used to store the password s of employees
- Discussion form could be provided to discuss most important academic topics
- Here we have assumes a single store room is used to store all chemicals case should be taken to handle multiple store rooms

# Appendix A

## BIBLIOGRAPHY

**BOOKS REFERED**


- Teach Yourself PHP and MySQL: by Sam Series
- Head First PHP and MySQL: by Michael Morrison
- Programming PHP: by Peter Macintyre
- Web technology : by Xavier
- Database concepts : by Navathe


**WEBSITES REFERED**


- w3schools.com
- sitepoint.com
- php.net

# Appendix B: User Manual

**For admin**

Step1:

Open website by its url, select login link, choose login type as admin, input user name and password click submit button

Step2:

On successful login admin will be redirected to homepage having various links

Step3:

Use appropriate links to perform various tasks.

**For Staff**

Step1:

Open website by its url, select login link, choose login type as staff, input user name and password, click submit button

Step2:

On successful login staff will be redirected to homepage having various links

Step3:

Use navbar associated with dropdown links to perform various tasks; such as managing register book, uploading video's, managing breakage amount etc

**For students**

Sep1:

Open the website using URL

Step2:

Web site is having information such as notifications, videos etc., use them to get information.