Data Base Management System Project

PREPARED BY

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FACULTY GUIDES

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April 2022

CERTIFICATE

This is to certify that the project work entitled "**Data Base Management System**" submitted by **Garv Baheti (2020BTechCSE031), Shubham Sharma (2020BTechCSE072) and Siddharth Jangid (2020BTechCSE074)** towards the partial fulfillment of the requirements for the degree of **Bachelor of Technology in Computer Science Engineering** of JK Lakshmipat University Jaipur is the record of work carried out by them under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted.

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Date of Submission: 25 April 2022

ACKNOWLEDGEMENTS

We would like to express our heartfelt gratitude to Dr. Taruna Sunil, Associate Professor, Department of Computer Science Engineering, Institute of Engineering & Technology for her valuable time and guidance that made the project work a success. We want to express gratitude toward JK Lakshmipat University to give us such great Faculty. I would thank my batchmates for aiding me at whatever second.

Sincerely yours,
Garv Baheti (2020BTechCSE031)
Shubham Sharma (2020BTechCSE072)
Siddharth Jangid (2020BTechCSE074)

OBJECTIVE

PROJECT NAME: UNIVERSITY CREDIT CARD

To design a student credit card which can only be used within the university places like Bookstore, Canteen, Shopping Stores, Utility Stores, Tea Stalls etc. Card will be same as ID Card, but additional QR/Bar Code can be printed on it which can be scanned at stores to get the information of student for making the transaction. Credit limit of Rs. 15000 will be provided to each student which has to be repaid at the end of semester.

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INTRODUCTION

1.1 About Database

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system, often shortened to just database.

1.2 Data Base Management System

A database management system (or DBMS) is essentially nothing more than a computerized data-keeping system. Users of the system are given facilities to perform several kinds of operations on such a system for either manipulation of the data in the database or the management of the database structure itself. Database Management Systems (DBMSs) are categorized according to their data structures or types

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1.2.1 Benefits Of Database Management Systems

The concept of using database management systems in business was first proposed years ago, and it is still quite popular among businesses today. Despite the fact that Database Management systems require a significant investment in server infrastructure, maintenance, and security, an increasing number of businesses are deploying databases to handle corporate documents and records. The reason for that is that Database Management Systems have a lot of benefits to offer to the users. Some of the benefits which DataBase Management Systems have to offer to us:

- **Data Integrity:** Data Integrity is maintained in a Database Management System. This means that the structure of the database can change, but the application that uses the data does not have to change.
- **Data Consistency:** Data Consistency is also maintained in a Database Management System. The data is identical regardless of who is inspecting it.
- **Data Backups**: Backing up data from a single location is simple.
- **Data Security:** In DBMSs, Data is housed in a secure central location, and many access privileges can be assigned to multiple people.
- **Customization of Applications:** Applications can be tailored to meet the specific needs of the user without having to change the database.
- **Data Accessibility:** One of the main benefits of a Database Management System is that the same business data can be made available to various personnel at any time and from

any location. A database management system (DBMS) allows multiple users to access information that is accessible remotely and twenty-four hours a day, seven days a week.

- **Data Redundancy or Data Duplication is Minimized:** In a database management system, information is kept concise and only appears once to avoid data unpredictability. This is done using a technique called Normalization (Database normalization is the process of structuring a database, usually a relational database, in accordance with a series of so called normal forms in order to reduce data redundancy and improve data integrity). Data redundancy is reduced as a result of this capability. For businesses, this implies that they won't have to repeat the same information over and over. Companies can now drastically cut the cost of storing company data on storage devices.
- **Data Management Made Simple:** Another benefit of database management software is that it facilitates data management by providing users with easy yet powerful tools for entering, changing, and exporting corporate data. Through data customization, Database Management System also decreases individual users' reliance on computer specialists and programmers to satisfy their specific demands.
- **No Dependency on Any Programming Language:** Yet another benefit of Database Management Systems is that it is independent of any type of programming language. This means that one does not have to know any specific programming language in order to access a Database Management System. Writing SQL or NoSQL queries would be sufficient irrespective of what programming language is being used in the application.
- **Data Durability:** Database Management Systems also ensures data durability, that is, even if there is a power outage or any other disaster for that matter, the data in the Database will persist.

1.2.1 **Popular DBMS Software**

Here, is the list of some popular DBMS system:

- MySQL
- Microsoft Access
- Oracle
- PostgreSQL
- dBASE
- FoxPro

- SQLite
- IBM DB2
- LibreOffice Base
- MariaDB
- Microsoft SQL Server etc.

1.3 **Types of DBMS**

The main Four Types of Database Management System are:

- Hierarchical database
- Network database
- Relational database
- Object-Oriented database

1.4 **Advantages of DBMS**

- DBMS offers a variety of techniques to store & retrieve data
- DBMS serves as an efficient handler to balance the needs of multiple applications using the same data
- Uniform administration procedures for data
- Application programmers never exposed to details of data representation and storage.
- A DBMS uses various powerful functions to store and retrieve data efficiently.
- Offers Data Integrity and Security
- The DBMS implies integrity constraints to get a high level of protection against prohibited access to data.
- A DBMS schedules concurrent access to the data in such a manner that only one user can access the same data at a time
- Reduced Application Development Time

1.5 **Disadvantage of DBMS**

DBMS may offer plenty of advantages but, it has certain flaws-

- Cost of Hardware and Software of a DBMS is quite high which increases the budget of your organization.
- Most database management systems are often complex systems, so the training for users to use the DBMS is required.
- In some organizations, all data is integrated into a single database which can be damaged because of electric failure or database is corrupted on the storage media
- Use of the same program at a time by many users sometimes lead to the loss of some data.
- DBMS can’t perform sophisticated calculations

TECHNOLOGY STACK

2.1 PHP

PHP is a general-purpose scripting language geared toward web development. It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1994. The PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor. PHP code is usually processed on a web server by a PHP interpreter implemented as a module, a daemon or as a Common Gateway Interface (CGI) executable. On a web server, the result of the interpreted and executed PHP code – which may be any type of data, such as generated HTML or binary image data – would form the whole or part of an HTTP response. Various web template systems, web content management systems, and web frameworks exist which can be employed to orchestrate or facilitate the generation of that response. Additionally, PHP can be used for many programming tasks outside the web context, such as standalone graphical applications and robotic drone control. PHP code can also be directly executed from the command line. The standard PHP interpreter, powered by the Zend Engine, is free software released under the PHP License. PHP has been widely ported and can be deployed on most web servers on a variety of operating systems and platforms. The PHP language evolved without a written formal specification or standard until 2014, with the original implementation acting as the de facto standard which other implementations aimed to follow. Since 2014, work has gone on to create a formal PHP specification.

2.2 HTML/CSS

HTML (the Hypertext Markup Language) and CSS (Cascading Style Sheets) are two of the core technologies for building Web pages. HTML provides the structure of the page, CSS the (visual and aural) layout, for a variety of devices. Along with graphics and scripting, HTML and CSS are the basis of building Web pages and Web Applications.

2.2.1 HTML

HTML is the language for describing the structure of Web pages. HTML gives authors the means to:

- Publish online documents with headings, text, tables, lists, photos, etc.
- Retrieve online information via hypertext links, at the click of a button.

- Design forms for conducting transactions with remote services, for use in searching for information, making reservations, ordering products, etc.
- Include spread-sheets, video clips, sound clips, and other applications directly in their documents.

With HTML, authors describe the structure of pages using *markup*. The *elements* of the language label pieces of content such as “paragraph,” “list,” “table,” and so on.

2.2.2 CSS

CSS is the language for describing the presentation of Web pages, including colors, layout, and fonts. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers. CSS is independent of HTML and can be used with any XML-based markup language. The separation of HTML from CSS makes it easier to maintain sites, share style sheets across pages, and tailor pages to different environments. This is referred to as the *separation of structure (or: content) from presentation.*

2.3 MariaDB SQL Server

MariaDB is a popular fork of MySQL created by MySQL's original developers. It grew out of concerns related to MySQL's acquisition by Oracle. It offers support for both small data processing tasks and enterprise needs. It aims to be a drop-in replacement for MySQL requiring only a simple uninstall of MySQL and an install of MariaDB. MariaDB offers the same features of MySQL and much more.

2.3.1 Key Features of MariaDB

The important features of MariaDB are −

- All of MariaDB is under GPL, LGPL, or BSD.
- MariaDB includes a wide selection of storage engines, including high-performance storage engines, for working with other RDBMS data sources.
- MariaDB uses a standard and popular querying language.

- MariaDB runs on a number of operating systems and supports a wide variety of programming languages.
- MariaDB offers support for PHP, one of the most popular web development languages.
- MariaDB offers Galera cluster technology.
- MariaDB also offers many operations and commands unavailable in MySQL, and eliminates/replaces features impacting performance negatively.

ANALYSIS & REQUIREMENT SPECIFICATIONS

3.1 Platform Features

- User Accounts Access (admin/student) functionality
- Ability to display all the details of student on student dashboard
- Ability to show all the student details to admin
- Ability to show all the transactions in database to admin
- Automatic balance reduction from database when transaction is done

3.2 Technology Stack

To develop the Interative Frontend Web Application by using HTML/CSS and PHP to handle the logic, authentication and communication with the database. We used MariaDB version of SQL Database to store all the data required by our web application.

3.3 System Requirements

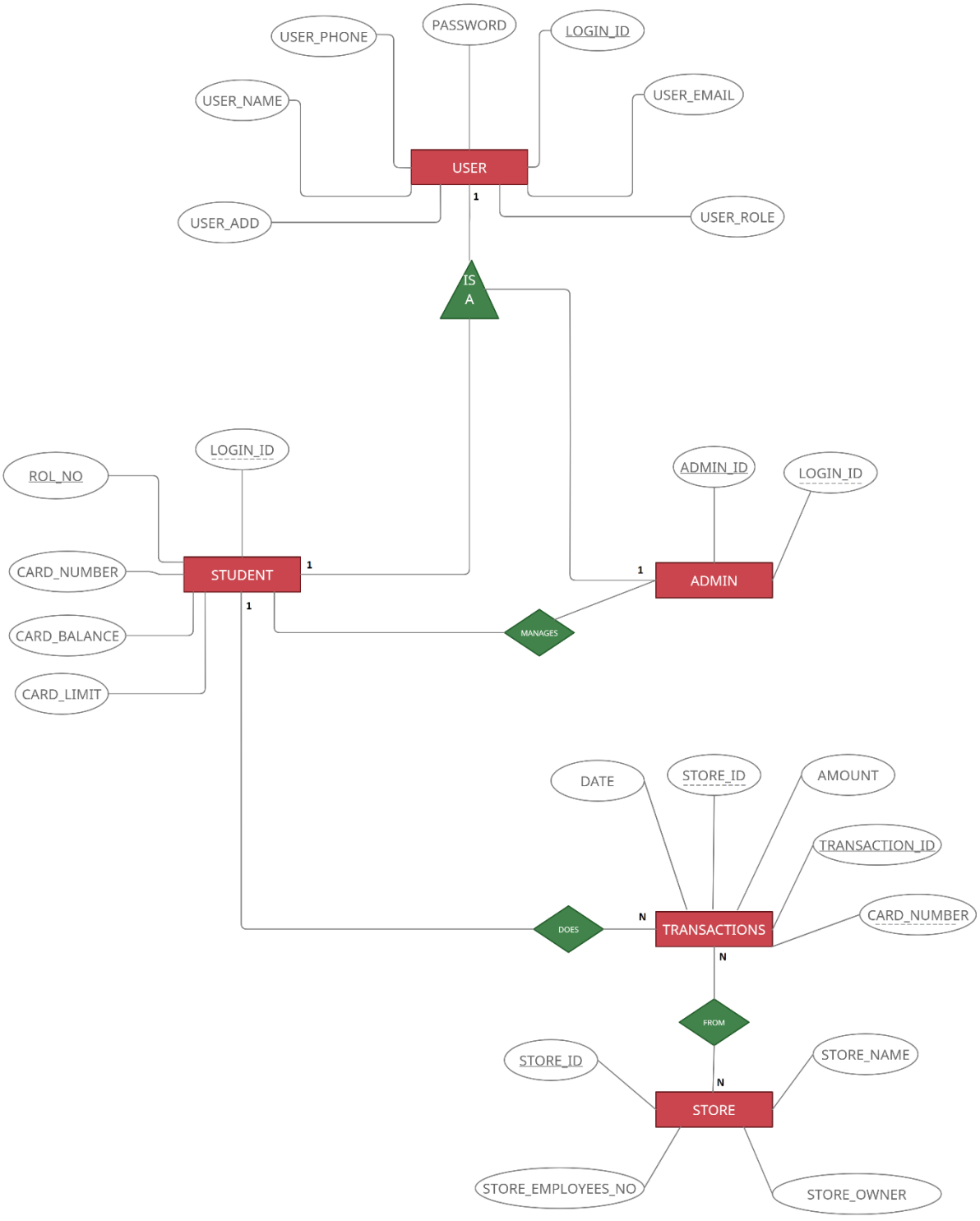
The application can be hosted online for easy access to platform and its services and hence not many hardware specifications are required to access it.

3.4 Minimum Requirement specification

- A Computer System
- Internet Connection (if hosted online or we can use localhost)
- Browser to access the web application

SYSTEM DESIGN

4.1 ER Model



4.2 Relational Schema

USER (LOGIN_ID, PASSWORD, USER_ROLE, USER_NAME, USER_ADD, USER_EMAIL, USER_PHONE)

STUDENT (ROL_NO, CARD_NUMBER, CARD_LIMIT, CARD_BALANCE, LOGIN_ID)

ADMIN (ADMIN_ID, LOGIN_ID)

TRANSACTIONS (TRANSACTION_ID, STORE_ID, DATE, AMOUNT, CARD_NUMBER)

STORE (STORE_ID, STORE_NAME, STORE_EMPLOYEES_NO, STORE_OWNER)

IMPLEMENTATION

5.1 Platform Features

This Project uses MariaDb version of SQL as a database. The below code snippets are used to implement the database structure:

5.1.1 Database Creation

```
CREATE DATABSE creditcard;
USE creditcard;
```

5.1.2 Tables Creation

```
CREATE TABLE user(
       LOGIN_ID VARCHAR(30) NOTNULL,
       PASSWORD VARCHAR(30) NOTNULL,
       USER_ROLE VARCHAR(20) NOTNULL,
       USER_NAME VARCHAR(30) NOTNULL,
       USER_ADD VARCHAR(50) NOTNULL,
       USER_PHONE BIGINT(10) NOTNULL,
       USER_EMAIL VARCHAR(30) NOTNULL UNIQUE,
       PRIMARY KEY(LOGIN_ID));


CREATE TABLE STUDENT(
       ROL_NO VARCHAR(30) NOT NULL,
       CARD_NUMBER NUMERIC(16,0) NOT NULL,
       CARD_LIMIT VARCHAR(30),
       CARD_BALANCE VARCHAR(30),
       LOGIN_ID VARCHAR(30) NOT NULL,
       PRIMARY KEY(ROL_NO,CARD_NUMBER),
       KEY `CARD_NUMBER` (CARD_NUMBER),
       KEY `ROL_NO` (ROL_NO),
       CONSTRAINT `STD_IBFK_1` FOREIGN KEY(LOGIN_ID) REFERENCES
USER(LOGIN_ID));


CREATE TABLE STORES(
       STORE_ID VARCHAR(30) NOT NULL,
       STORE_NAME VARCHAR(30) NOT NULL,
       STORE_EMPLOYEES_NO INT(8) NOT NULL,
       STORE_OWNER VARCHAR(30) NOT NULL,
```

```
       PRIMARY KEY(STORE_ID));


CREATE TABLE ADMIN(
       ADMIN_ID VARCHAR(30) NOT NULL,
       LOGIN_ID VARCHAR(30) NOT NULL,
       PRIMARY KEY (ADMIN_ID),
       LOGIN_ID REFERENCES USER(LOGIN_ID));


CREATE TABLE TRANSACTIONS(
       TRANSACTION_ID VARCHAR(30) NOT NULL,
       STORE_ID VARCHAR(30) NOT NULL,
       T_DATE DATE NOT NULL,
       AMOUNT BIGINT(10) NOT NULL,
       CARD_NUMBER BIGINT(16) NOT NULL,
       PRIMARY KEY(TRANSACTION_ID),
       FOREIGN KEY(STORE_ID) REFERENCES STORE(STORE_ID),
       CONSTRAINT `T_IBFK_1` FOREIGN KEY(CARD_NUMBER) REFERENCES
STUDENT(CARD_NUMBER));
```

5.1.3 Triggers Creation

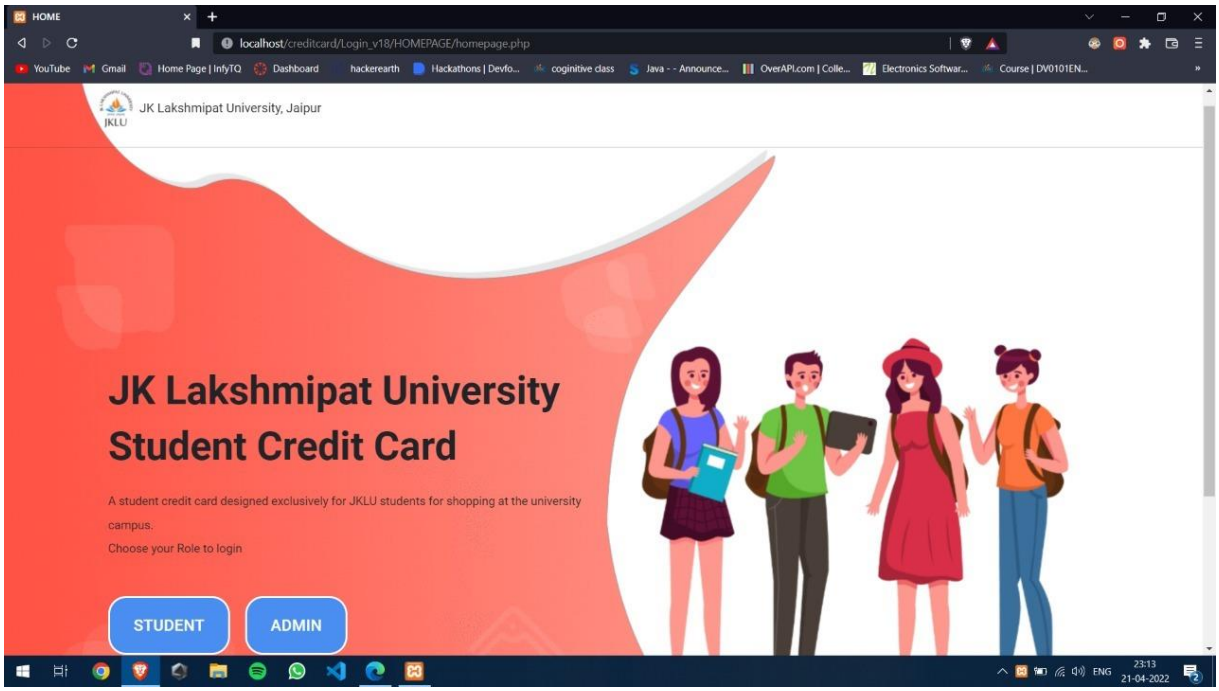
```
CREATE TRIGGER UPDATE_BALANCE
      AFTER INSERT ON transactions
      FOR EACH ROW
      UPDATE student SET CARD_BALANCE = CARD_BALANCE - NEW.AMOUNT WHERE
CARD_NUMBER = NEW.CARD_NUMBER


CREATE TRIGGER upper_role
      BEFORE INSERT ON user
      FOR EACH ROW
      SET NEW.USER_ROLE=UPPER(NEW.USER_ROLE)


CREATE TRIGGER upper_address
      BEFORE INSERT ON user
      FOR EACH ROW
      SET NEW.USER_ADD=UPPER(NEW.USER_ADD)


CREATE TRIGGER lower_login
      BEFORE INSERT ON user
      FOR EACH ROW
      SET NEW.LOGIN_ID=LOWER(NEW.LOGIN_ID)
```

5.2 SQL Connection with front end

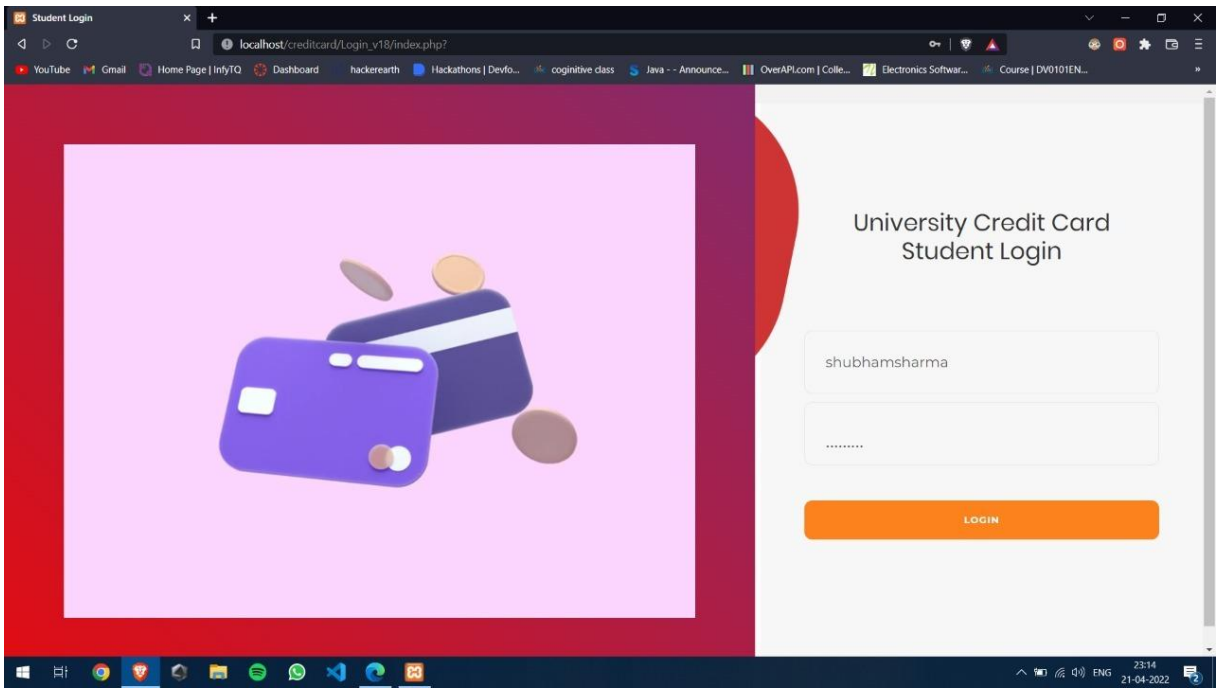
```php
<?php
session_start();

$con = mysqli_connect('localhost','root','');

mysqli_select_db($con, 'creditcard');

$name = $_POST['rollno'];
$pass = $_POST['pass'];

$s = "select * from user where LOGIN_ID='$name'&& PASSWORD='$pass'";
$result= mysqli_query($con,$s);
$num= mysqli_num_rows($result);

if($num==1){
    header("location:http://localhost/creditcard/Login_v18/templatemo_441_volt
on/dashboard2.php?" . $name );
}
else{
    header("location:http://localhost/creditcard/Login_v18/index.php?");
}
?>
```

APPLICATION SCREENSHOTS

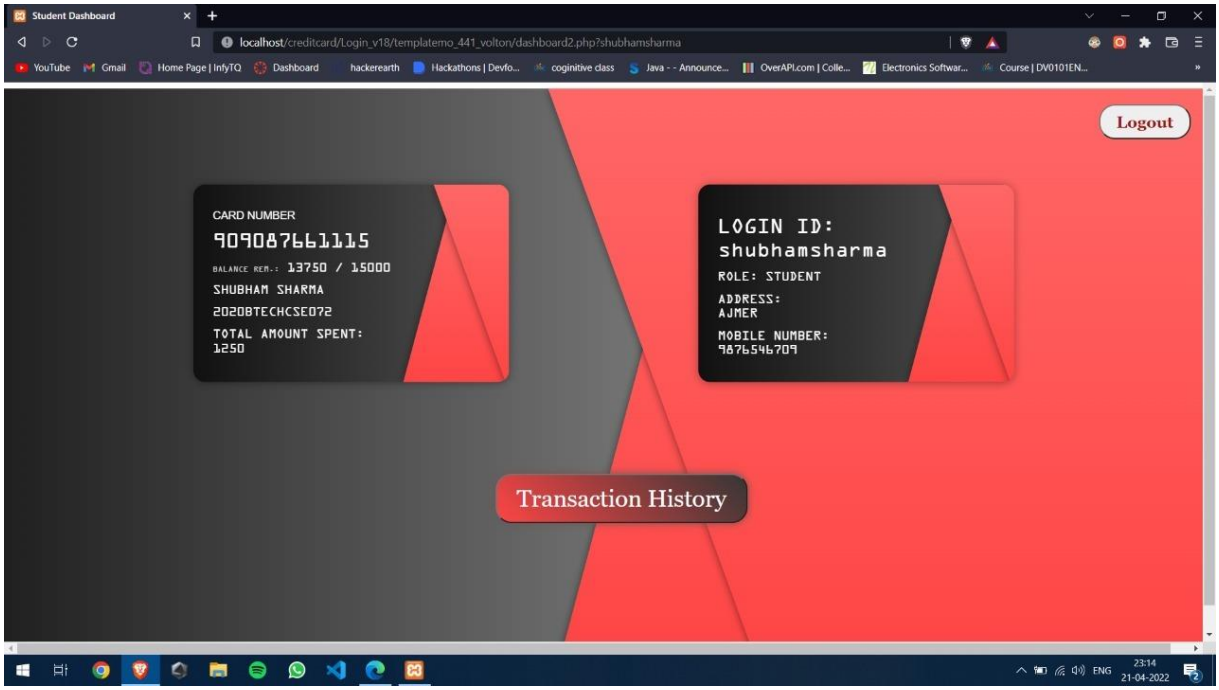
Homepage

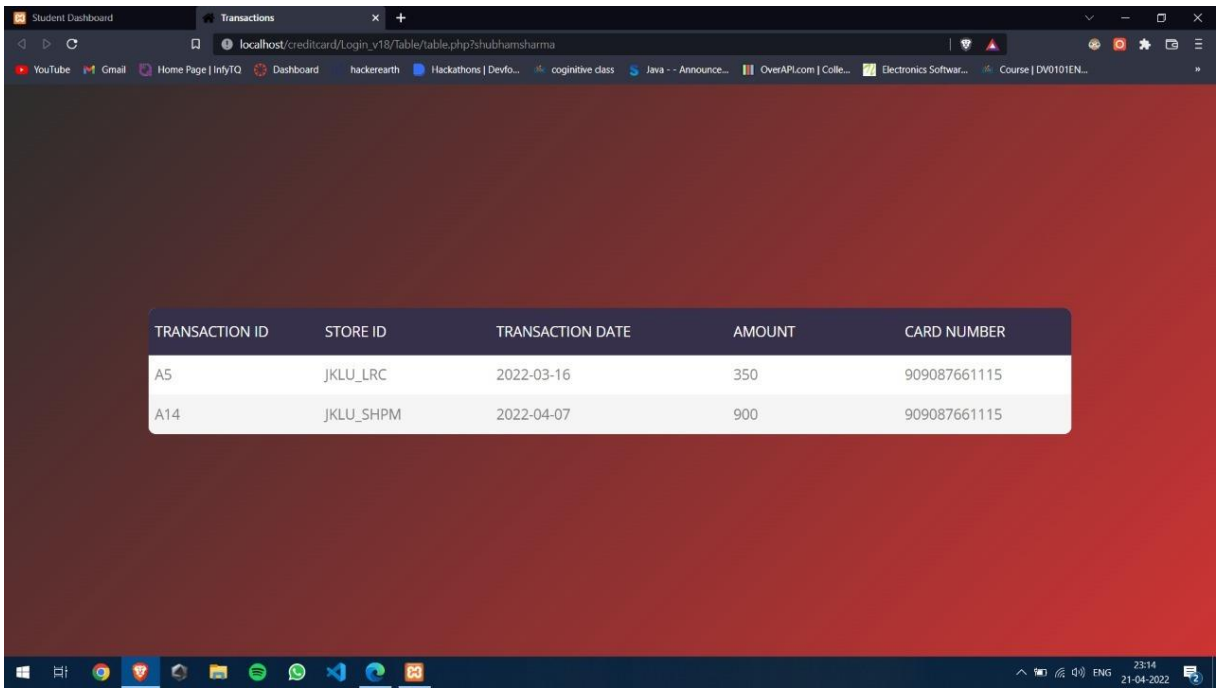


Student Login Page

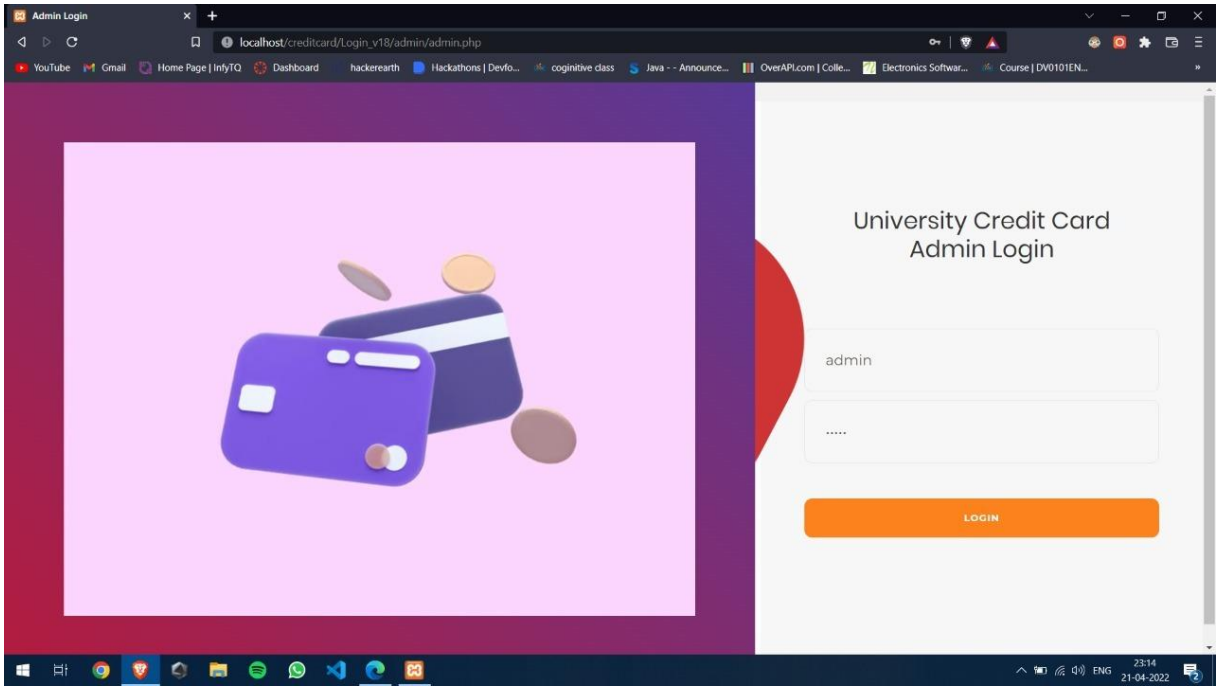


Student Dashboard

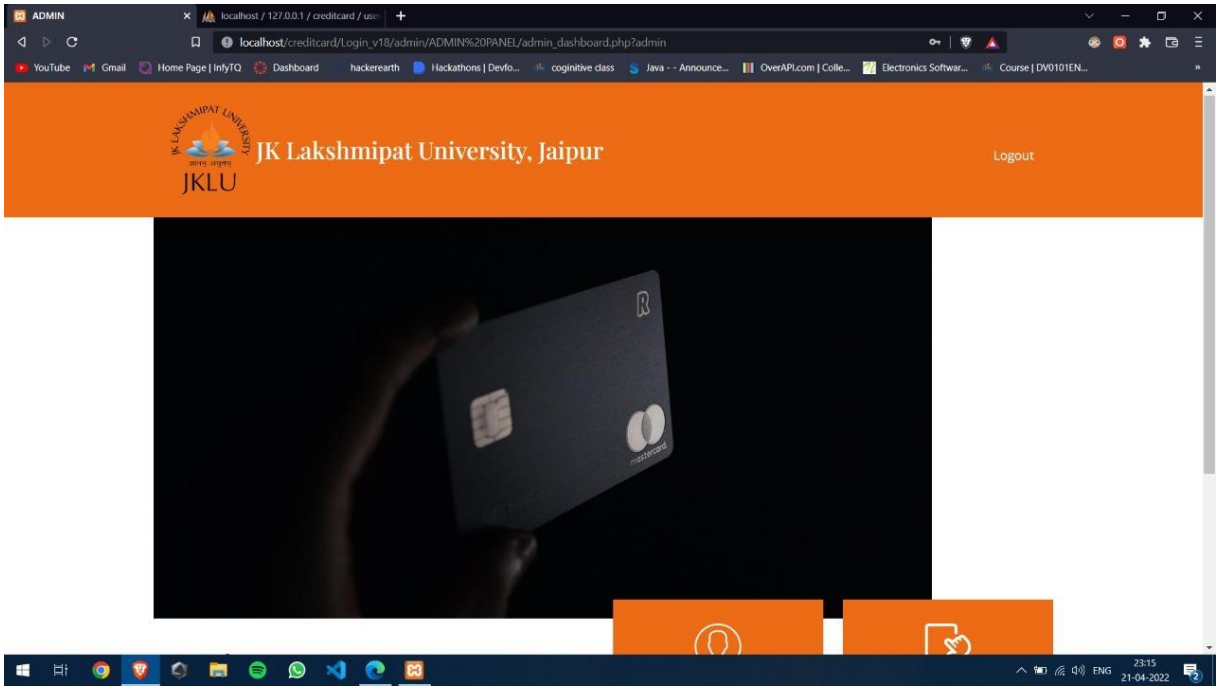


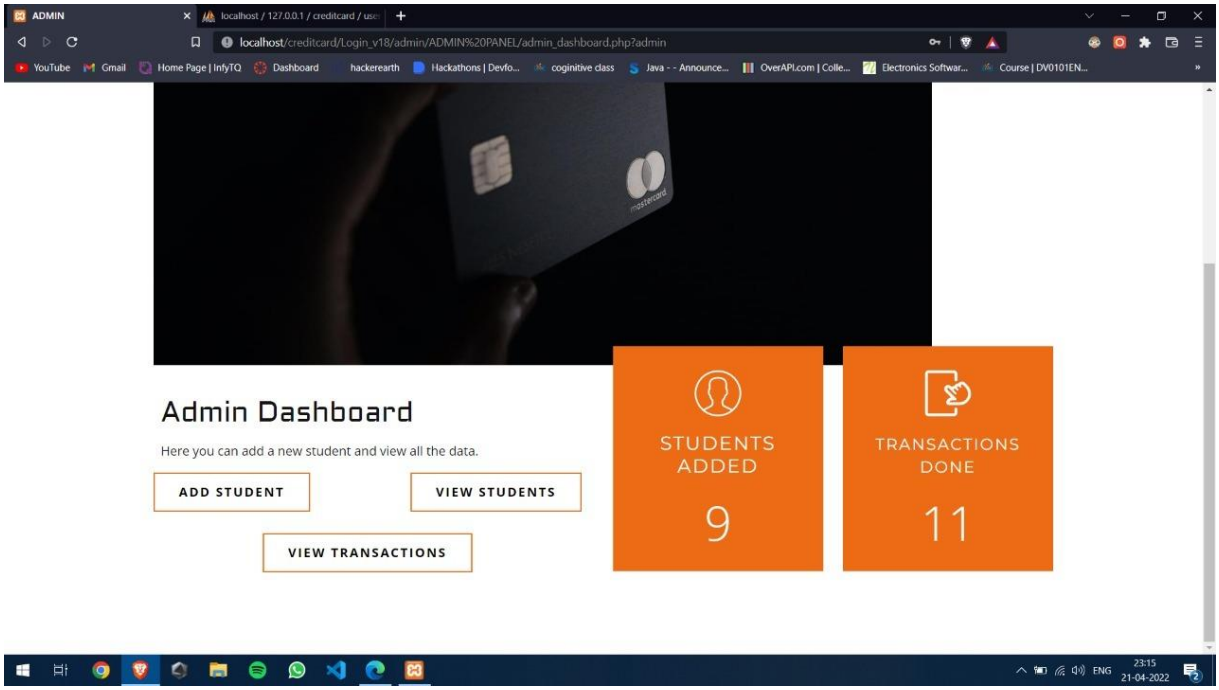


Admin Login Page

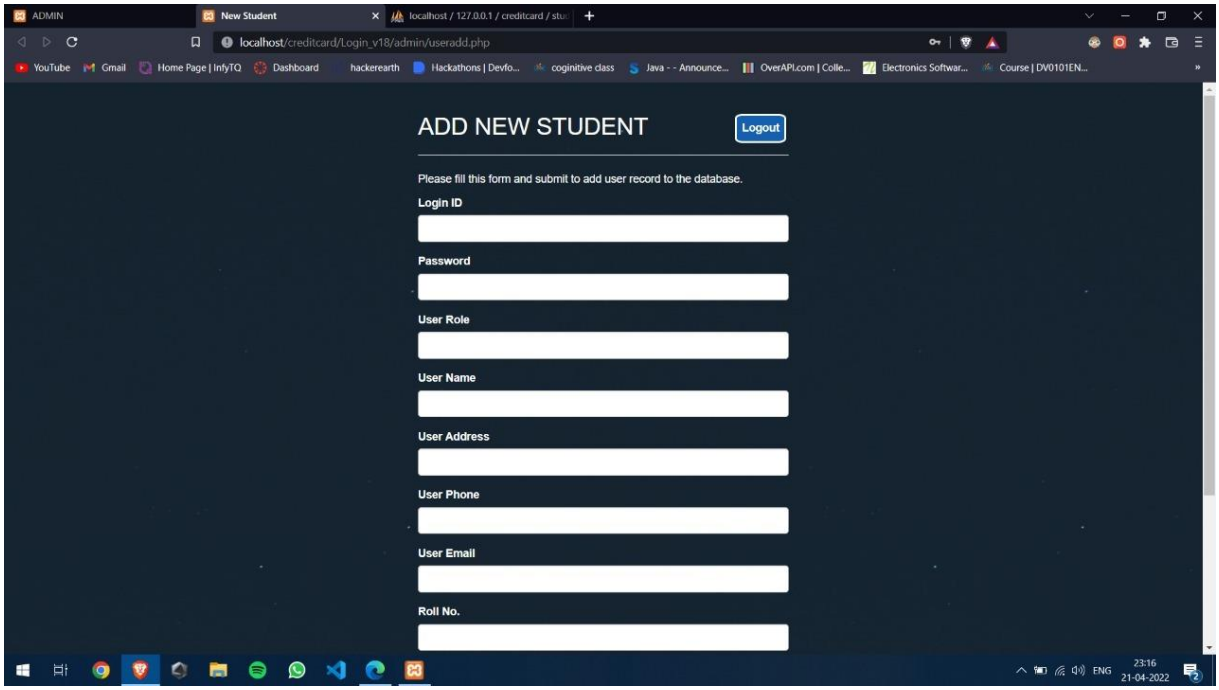


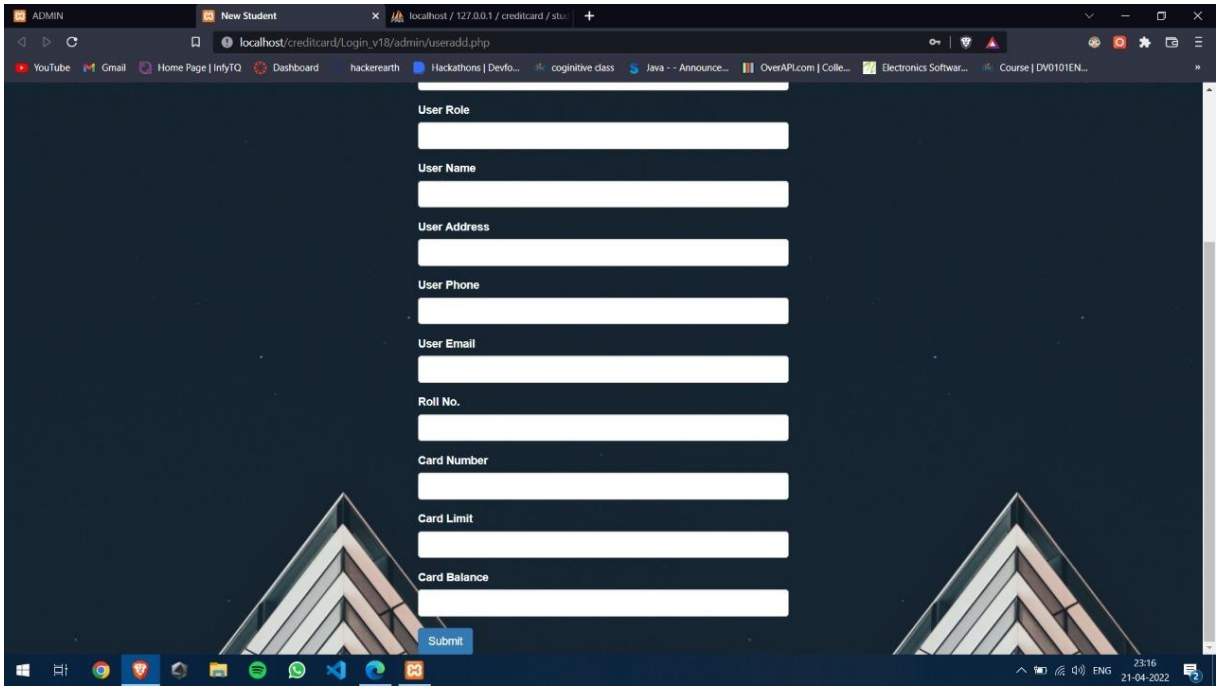
Admin Dashboard



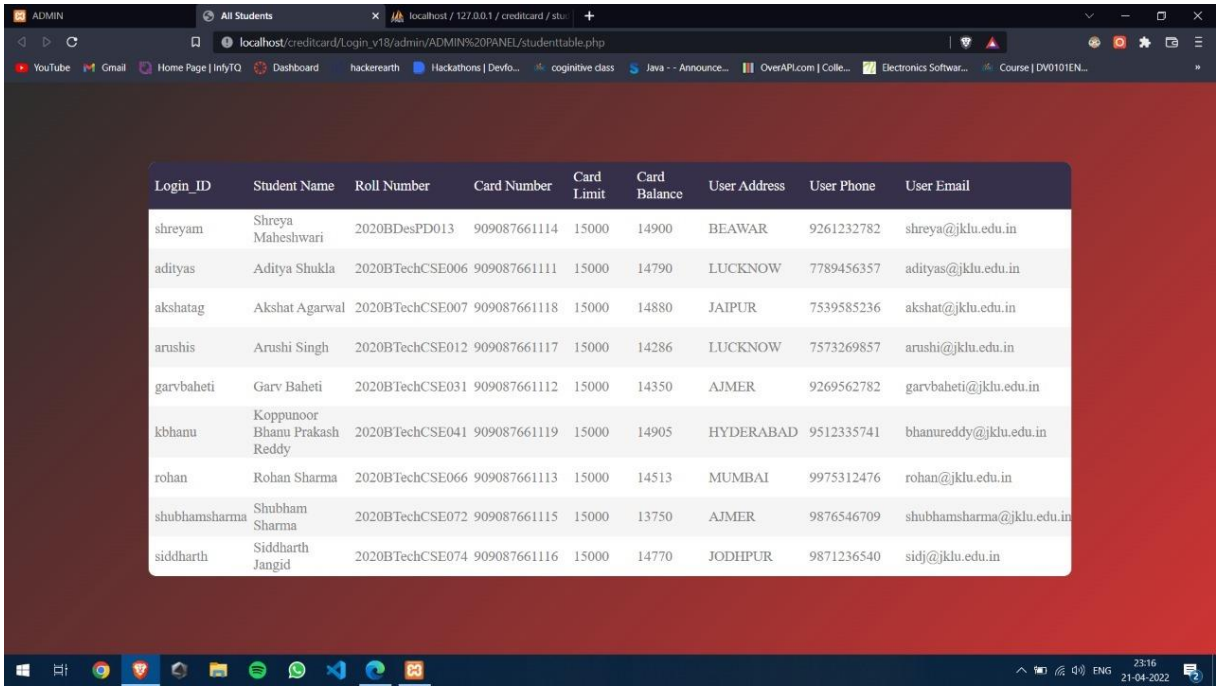


New Student Add Page



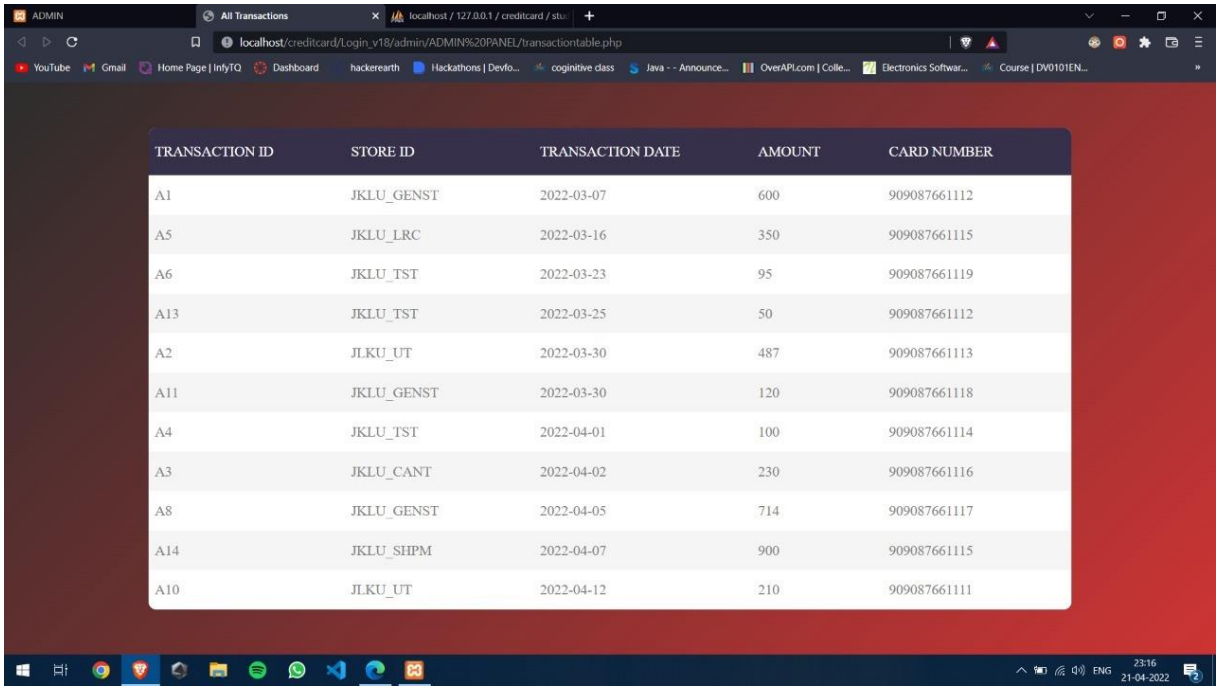


Student Table from Admin Dashboard



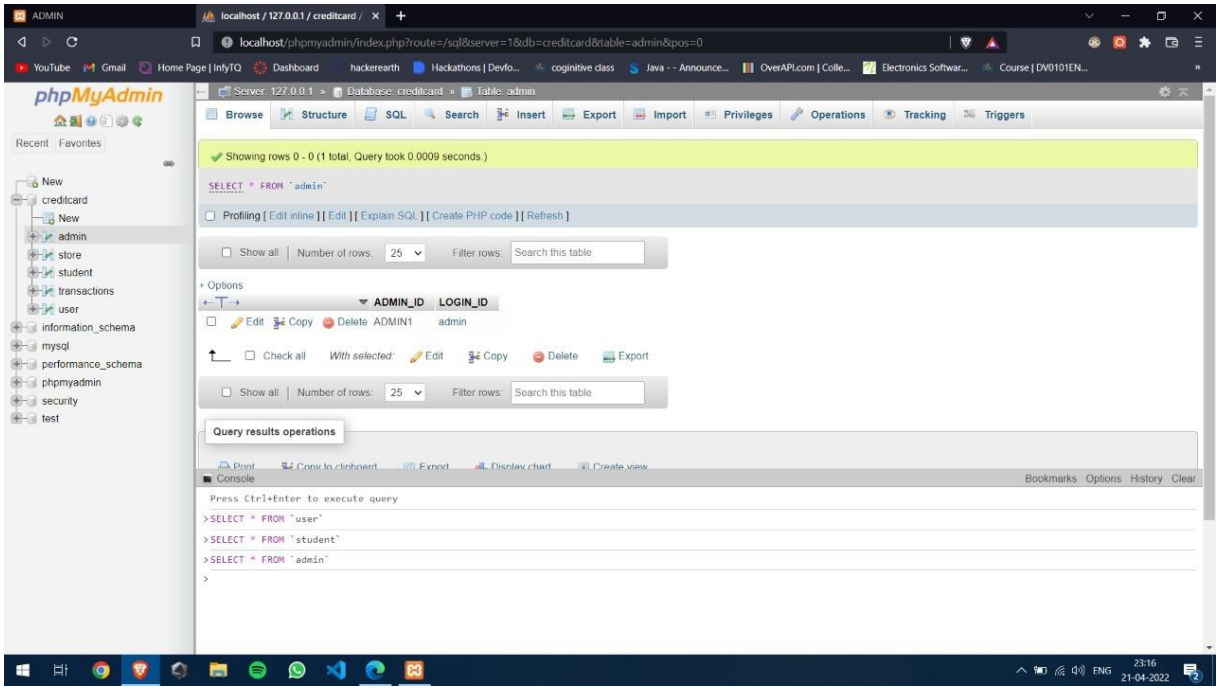
Login_ID	Student Name	Roll Number	Card Number	Card Limit	Card Balance	User Address	User Phone	User Email
shreyam	Shreya Maheshwari	2020BDesPD013	909087661114	15000	14900	BEAWAR	9261232782	shreya@jklu.edu.in
adityas	Aditya Shukla	2020BTechCSE006	909087661111	15000	14790	LUCKNOW	7789456357	adityas@jklu.edu.in
akshatag	Akshat Agarwal	2020BTechCSE007	909087661118	15000	14880	JAIPUR	7539585236	akshat@jklu.edu.in
arushis	Arushi Singh	2020BTechCSE012	909087661117	15000	14286	LUCKNOW	7573269857	arushi@jklu.edu.in
garvbaheti	Garv Baheti	2020BTechCSE031	909087661112	15000	14350	AJMER	9269562782	garvbaheti@jklu.edu.in
kbhanu	Koppunoor Bhanu Prakash Reddy	2020BTechCSE041	909087661119	15000	14905	HYDERABAD	9512335741	bhanureddy@jklu.edu.in
rohan	Rohan Sharma	2020BTechCSE066	909087661113	15000	14513	MUMBAI	9975312476	rohan@jklu.edu.in
shubhamsharma	Shubham Sharma	2020BTechCSE072	909087661115	15000	13750	AJMER	9876546709	shubhamsharma@jklu.edu.in
siddharth	Siddharth Jangid	2020BTechCSE074	909087661116	15000	14770	JODHPUR	9871236540	sidj@jklu.edu.in

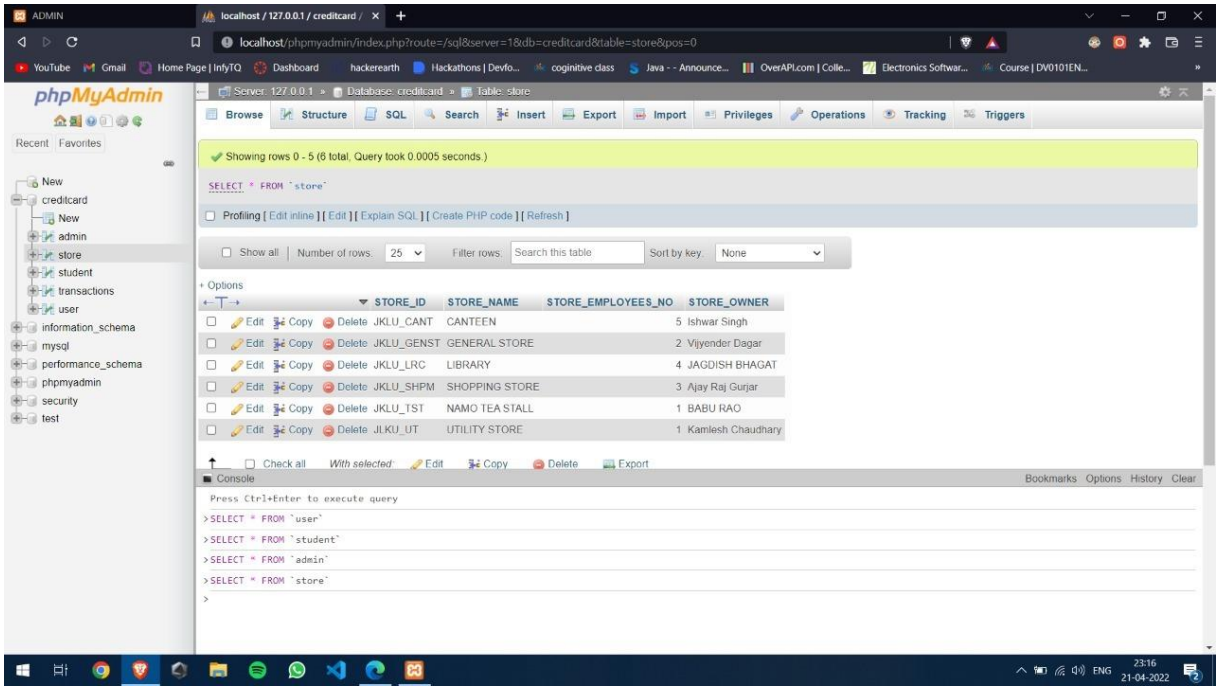
Transaction Table from Admin Dashboard

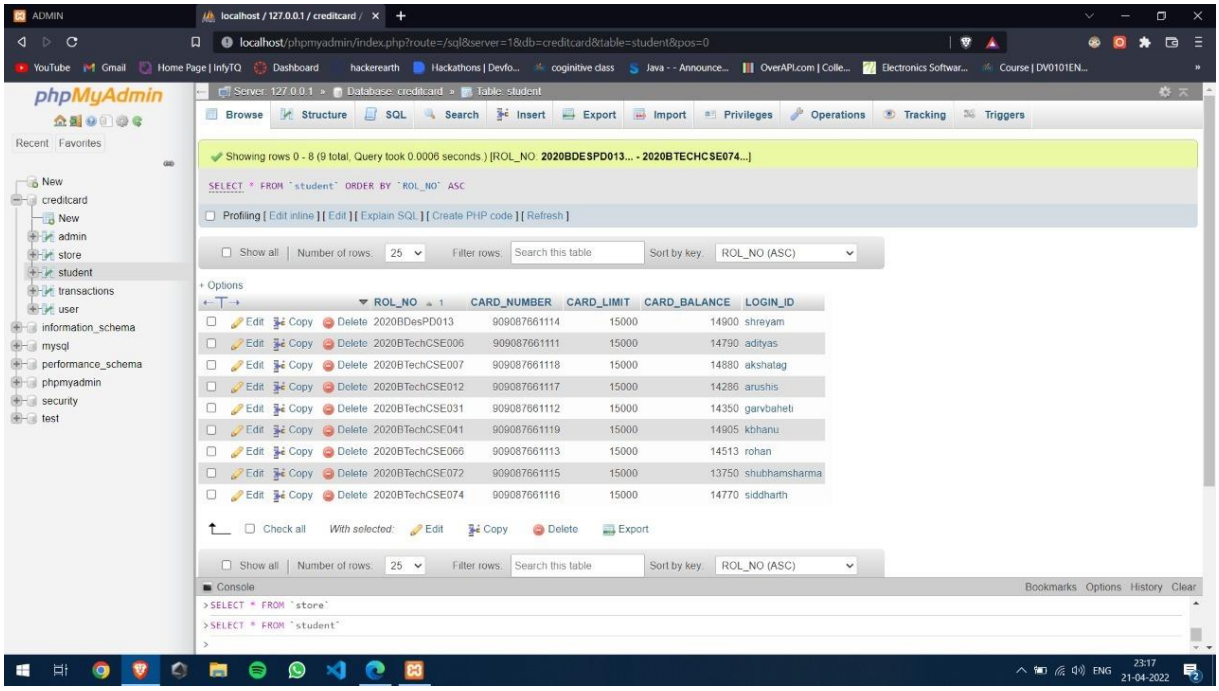


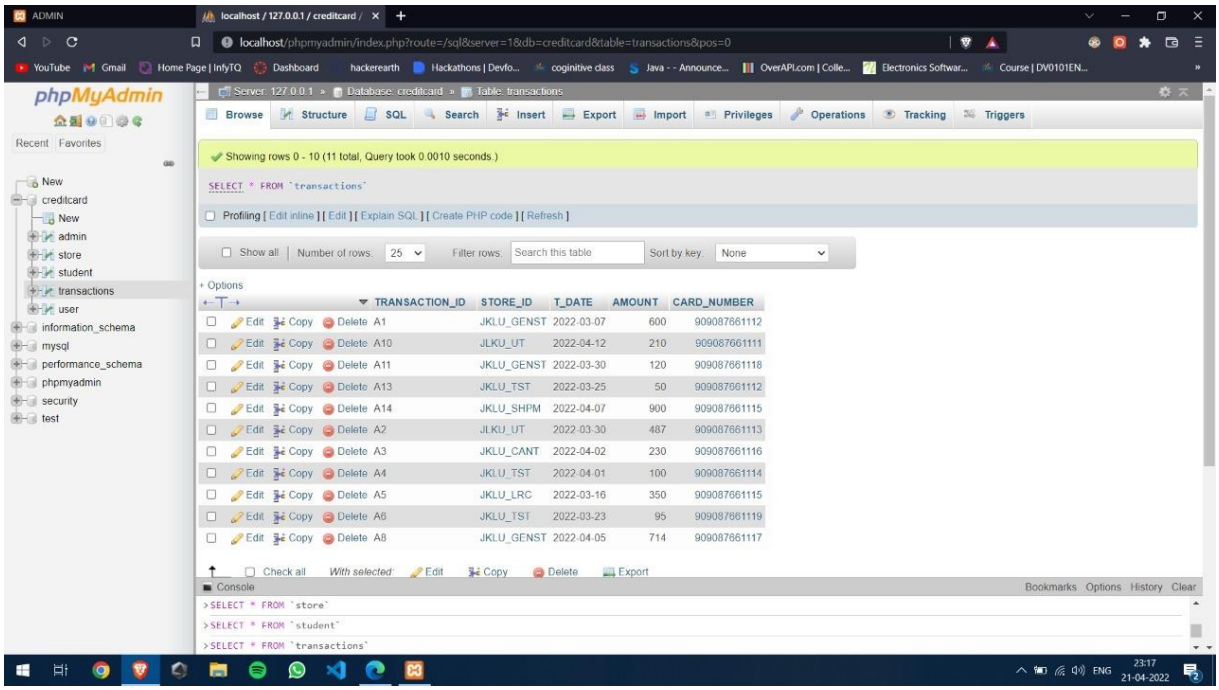
TRANSACTION ID	STORE ID	TRANSACTION DATE	AMOUNT	CARD NUMBER
A1	JKLU_GENST	2022-03-07	600	909087661112
A5	JKLU_LRC	2022-03-16	350	909087661115
A6	JKLU_TST	2022-03-23	95	909087661119
A13	JKLU_TST	2022-03-25	50	909087661112
A2	JLKU_UT	2022-03-30	487	909087661113
A11	JKLU_GENST	2022-03-30	120	909087661118
A4	JKLU_TST	2022-04-01	100	909087661114
A3	JKLU_CANT	2022-04-02	230	909087661116
A8	JKLU_GENST	2022-04-05	714	909087661117
A14	JKLU_SHPM	2022-04-07	900	909087661115
A10	JLKU_UT	2022-04-12	210	909087661111

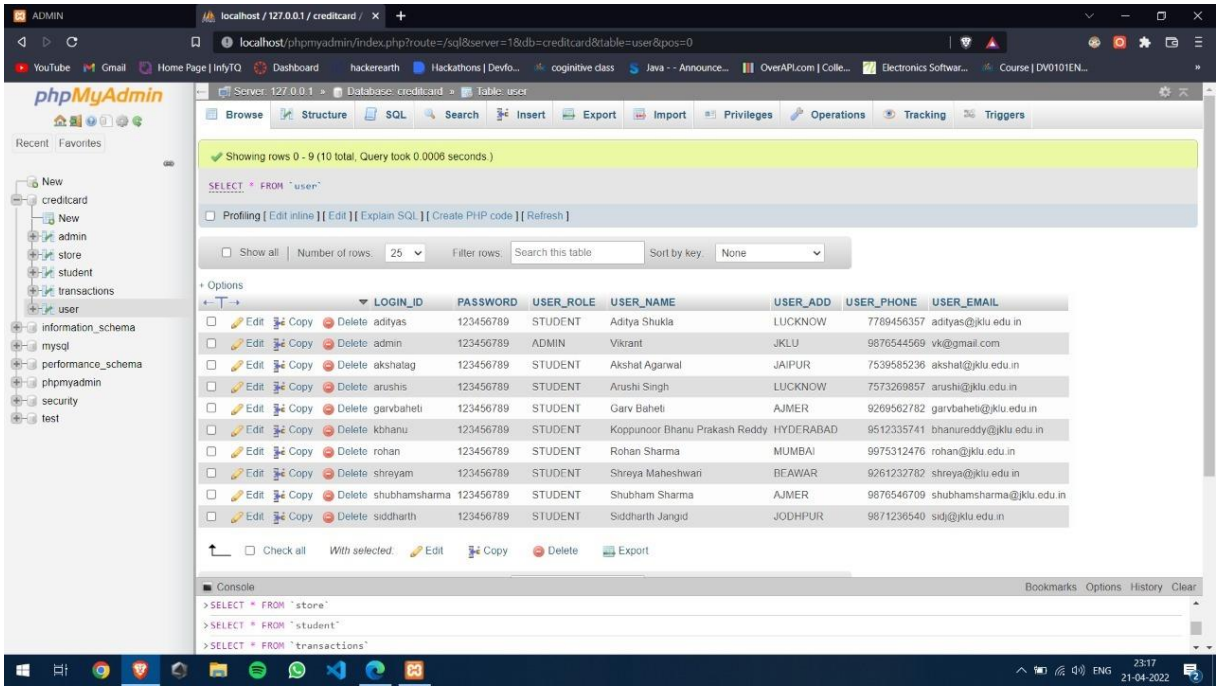
SQL Backend




localhost / 127.0.0.1 / creditcard /
localhost/phpmyadmin/index.php?route=/sql&server=1&db=creditcard&table=store&pos=0
phpMyAdmin
Server: 127.0.0.1 » Database: creditcard » Table: store
Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers
Showing rows 0 - 5 (6 total, Query took 0.0005 seconds.)
SELECT * FROM `store`
Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]
Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None
Options
STORE_ID STORE_NAME STORE_EMPLOYEES_NO STORE_OWNER
JKLU_CANT CANTEEN 5 Ishwar Singh
JKLU_GENST GENERAL STORE 2 Vijyender Dagar
JKLU_LRC LIBRARY 4 JAGDISH BHAGAT
JKLU_SHPM SHOPPING STORE 3 Ajay Raj Gurjar
JKLU_TST NAMO TEA STALL 1 BABU RAO
JLKU_UT UTILITY STORE 1 Kamlesh Chaudhary
Check all With selected: Edit Copy Delete Export
Console
Press Ctrl+Enter to execute query
>SELECT * FROM `user`
>SELECT * FROM `student`
>SELECT * FROM `admin`
>SELECT * FROM `store`
23:16 21-04-2022


localhost / 127.0.0.1 / creditcard /
localhost/phpmyadmin/index.php?route=/sql&server=1&db=creditcard&table=student&pos=0
phpMyAdmin
Server: 127.0.0.1 » Database: creditcard » Table: student
Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers
Showing rows 0 - 8 (9 total, Query took 0.0006 seconds.) [ROL_NO: 2020BDESPD013... - 2020BTECHCSE074...]
SELECT * FROM `student` ORDER BY `ROL_NO` ASC
Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]
Show all | Number of rows: 25 Filter rows: Search this table Sort by key: ROL_NO (ASC)
Options
ROL_NO CARD_NUMBER CARD_LIMIT CARD_BALANCE LOGIN_ID
2020BDesPD013 909087661114 15000 14900 shreyam
2020BTechCSE006 909087661111 15000 14790 adityas
2020BTechCSE007 909087661118 15000 14880 akshatag
2020BTechCSE012 909087661117 15000 14286 arushis
2020BTechCSE031 909087661112 15000 14350 garvbaheti
2020BTechCSE041 909087661119 15000 14905 kbhanu
2020BTechCSE066 909087661113 15000 14513 rohan
2020BTechCSE072 909087661115 15000 13750 shubhamsharma
2020BTechCSE074 909087661116 15000 14770 siddharth
Check all With selected: Edit Copy Delete Export
Console
>SELECT * FROM `store`
>SELECT * FROM `student`
23:17 21-04-2022


localhost/phpmyadmin/index.php?route=/sql&server=1&db=creditcard&table=transactions&pos=0
phpMyAdmin
Server: 127.0.0.1 » Database: creditcard » Table: transactions
Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers
Showing rows 0 - 10 (11 total, Query took 0.0010 seconds.)
SELECT * FROM `transactions`
TRANSACTION_ID STORE_ID T_DATE AMOUNT CARD_NUMBER
A1 JKLU_GENST 2022-03-07 600 909087661112
A10 JKLU_UT 2022-04-12 210 909087661111
A11 JKLU_GENST 2022-03-30 120 909087661118
A13 JKLU_TST 2022-03-25 50 909087661112
A14 JKLU_SHPM 2022-04-07 900 909087661115
A2 JKLU_UT 2022-03-30 487 909087661113
A3 JKLU_CANT 2022-04-02 230 909087661116
A4 JKLU_TST 2022-04-01 100 909087661114
A5 JKLU_LRC 2022-03-16 350 909087661115
A6 JKLU_TST 2022-03-23 95 909087661119
A8 JKLU_GENST 2022-04-05 714 909087661117
>SELECT * FROM `store`
>SELECT * FROM `student`
>SELECT * FROM `transactions`


localhost/phpmyadmin/index.php?route=/sql&server=1&db=creditcard&table=user&pos=0
phpMyAdmin
Server: 127.0.0.1 » Database: creditcard » Table: user
Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers
Showing rows 0 - 9 (10 total, Query took 0.0006 seconds.)
SELECT * FROM `user`
LOGIN_ID PASSWORD USER_ROLE USER_NAME USER_ADD USER_PHONE USER_EMAIL
adityas 123456789 STUDENT Aditya Shukla LUCKNOW 7789456357 adityas@jklu.edu.in
admin 123456789 ADMIN Vikrant JKLU 9876544569 vk@gmail.com
akshatag 123456789 STUDENT Akshat Agarwal JAIPUR 7539585236 akshat@jklu.edu.in
arushis 123456789 STUDENT Arushi Singh LUCKNOW 7573269857 arushi@jklu.edu.in
garvbaheti 123456789 STUDENT Garv Baheti AJMER 9269562782 garvbaheti@jklu.edu.in
kbhanu 123456789 STUDENT Koppunoor Bhanu Prakash Reddy HYDERABAD 9512335741 bhanureddy@jklu.edu.in
rohan 123456789 STUDENT Rohan Sharma MUMBAI 9975312476 rohan@jklu.edu.in
shreyam 123456789 STUDENT Shreya Maheshwari BEAWAR 9261232782 shreya@jklu.edu.in
shubhamsharma 123456789 STUDENT Shubham Sharma AJMER 9876546709 shubhamsharma@jklu.edu.in
siddharth 123456789 STUDENT Siddharth Jangid JODHPUR 9871236540 sidj@jklu.edu.in
>SELECT * FROM `store`
>SELECT * FROM `student`
>SELECT * FROM `transactions`

FUTURE SCOPE

- Creating Mobile Application which can store this card details as an Virtual Card
- Generating Bar Codes for each student automatically throught system for easier transactions
- Adding a additional 4-digit PIN for students to use it while transactions on stores
- Creating a Store End Mobile/Web Application which can be connected to bar code scanner through which transaction can be done.
- Implementing this application in University Campus

PROJECT FILES LINK

FRONT END File Link(HTML/CSS/PHP):

ONEDRIVE

GDRIVE

DATABASE File Link:

ONEDRIVE

GDRIVE

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