



Delhi Technological University

CO-202 Database Management Project

Government
Database System

Government Database System

by

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Bachelor of Technology

in

Computer Engineering

Under the supervision of and submitted to

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Declaration



"We do hereby declare that this submission is our own work conformed to the norms and guidelines given in the Ethical Code of Conduct of the Institute and that, to the best of our knowledge and belief, it contains no material previously written by another neither person nor material (data, theoretical analysis, figures, and text) which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text."

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Acknowledgement

I would like to express my special thanks and gratitude to my teacher Mr. Varun Sangwan as well as our college Delhi Technological University which gave me the golden opportunity to do this interesting project on the topic "**Government Database System**", which also helped me in doing a lot of research and discovering many new things on the subject matter.

Secondly, I would also like to thank my parents, friends and classmates who helped me a lot in finalizing this project within the limited time frame which had been given to us. I am really thankful to all of them.

My special thanks goes to my university i.e, Delhi Technological University for providing me such a great platform and such good teachers for overlooking my project and its progress. Having such a great curriculum which helps us to improve our learning skill as well as presenting our work in the form of a report, such as this kind of project work will definitely go a long way in my quest to improve my skills.

Abstract



The government is the biggest producer and supplier of information in a country. It is split into multiple departments for distribution of labour. Efficient storage, maintenance and management of the vast amount of data stored within these government departments is of utmost importance. Due to advancements in information and communication technology(ICT), various e-government solutions and applications have been implemented to improve government functioning.

However, keeping track of many such applications is tedious for consumers as well as the application developers. Therefore, in this project, we aim to build an all-in-one government database system which administers various government functionalities such as citizenship, passports, VISA, etc.

Introduction



The main business of the government consists of data processing and using information within its own departments and also dispensing a limited amount of it into the public. Thus, all of this work is highly data intensive. Consequently, the information system and management within the government and its departments must be effective and efficient.

Efficient storage, maintenance and management of the vast amount of data stored within these government departments is of utmost importance. Due to advancements in information and communication technology(ICT), various e-government solutions and applications have been implemented to improve government functioning.

However, these easy to use applications have still not been implemented in many crucial departments of the government. For example, in the Department of Motor Vehicles, a lot of information like license examinee certification, license trial permit and examination results are all examined, transferred and stored in papers, which is a highly unreliable and primitive method.



Additionally, the large number of these applications can make it difficult to keep track of each one- for the user as well as for the application developer. Routine upkeep and maintenance alone would sanction the creation of a whole new division inside departments, which would complicate things more.

Hence, in this project, we aim to resolve both of the above problems. We build an **all-in-one government database system** which administers various government functionalities such as citizenship, passports, VISA, etc.

Specifications



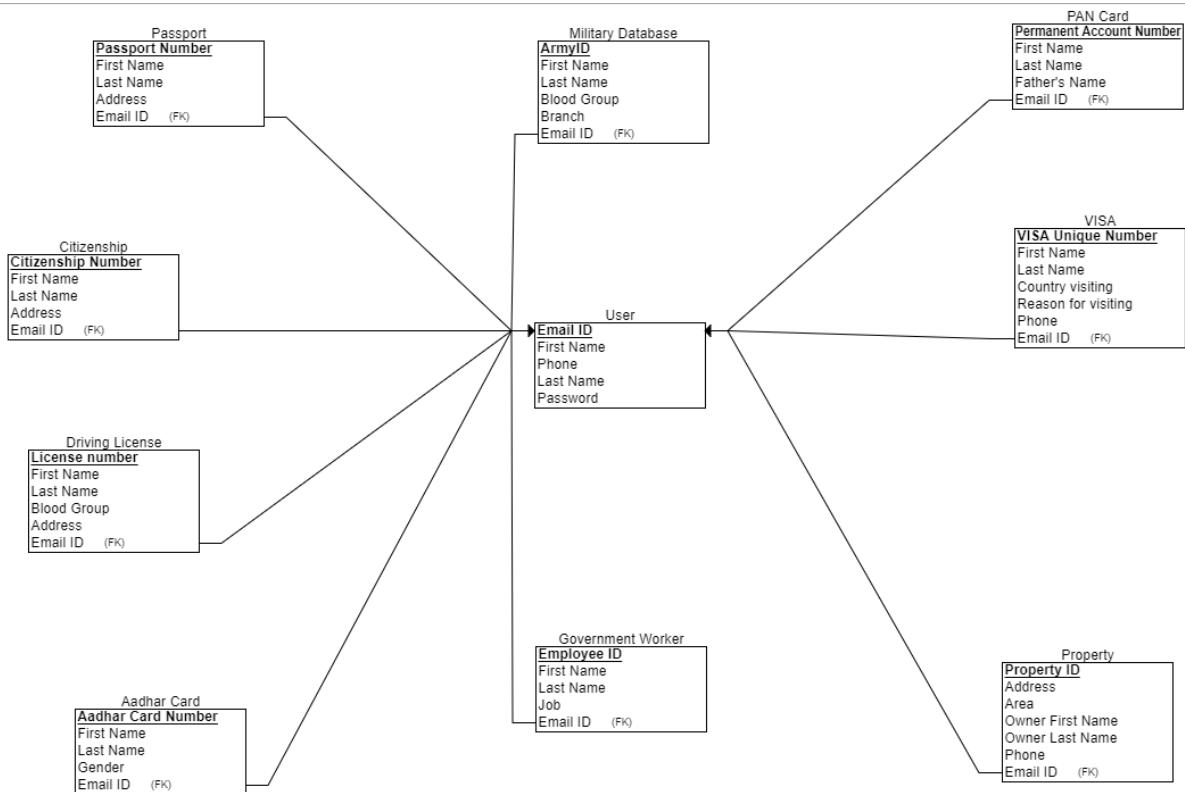
The system will be built using the following tools:

1. **XAMPP**- XAMPP is an abbreviation for cross-platform, Apache, MySQL, PHP and Perl. XAMPP is a completely free, easy to install Apache distribution containing MariaDB, PHP, and Perl. The XAMPP open source package has been set up to be incredibly easy to install and to use. XAMPP is the most popular PHP development environment. We will particularly be making use of the Apache and MySQL localhost servers that it provides.
2. **Visual Studio Code**- Visual Studio Code is a code editor redefined and optimized for building and debugging modern web and cloud applications. Visual Studio Code is free and easy to use with an interactive UI.
3. **phpMyAdmin**- phpMyAdmin is a free software tool written in PHP, intended to handle the administration of MySQL over the Web. phpMyAdmin supports a wide range of operations on MySQL. Frequently used operations can be performed via the user interface, while you still have the ability to directly execute any SQL statement.

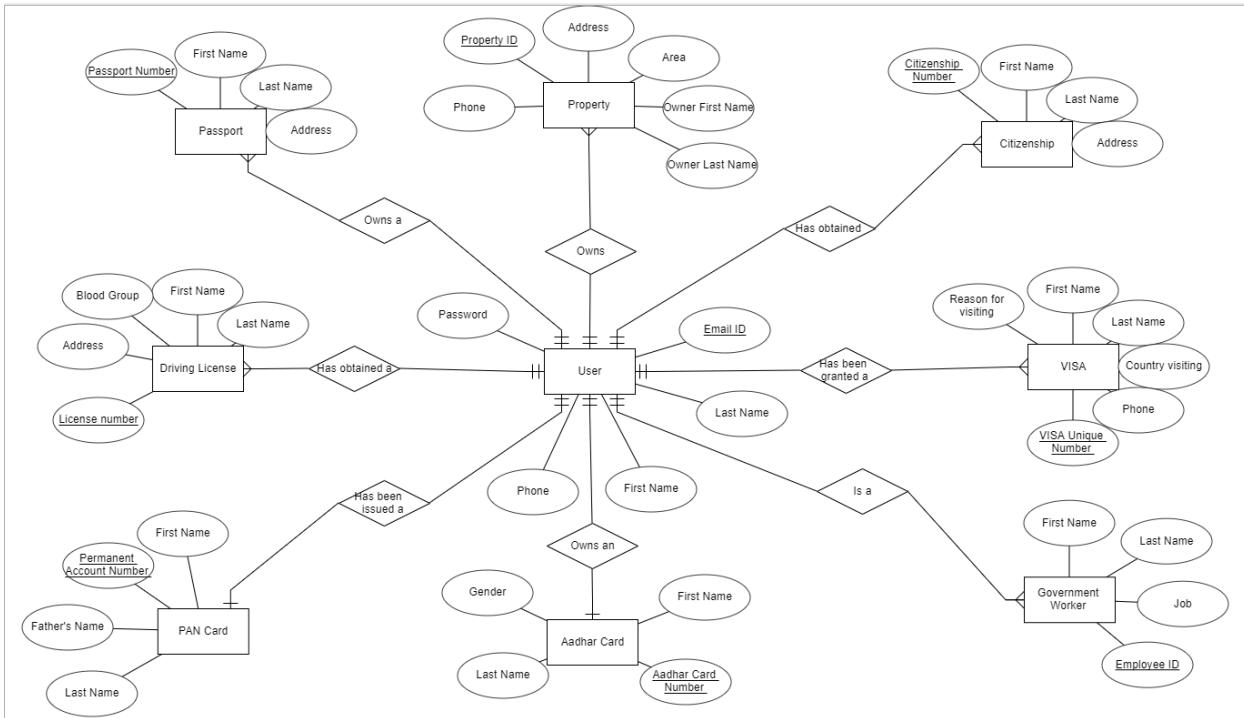
Relationship Schema and ER Diagram

We made the relationship schema and ER diagrams for our project on ERDPlus- A free database modeling tool for creating Entity Relationship Diagrams, Relational Schemas, Star Schemas, and SQL DDL statements.

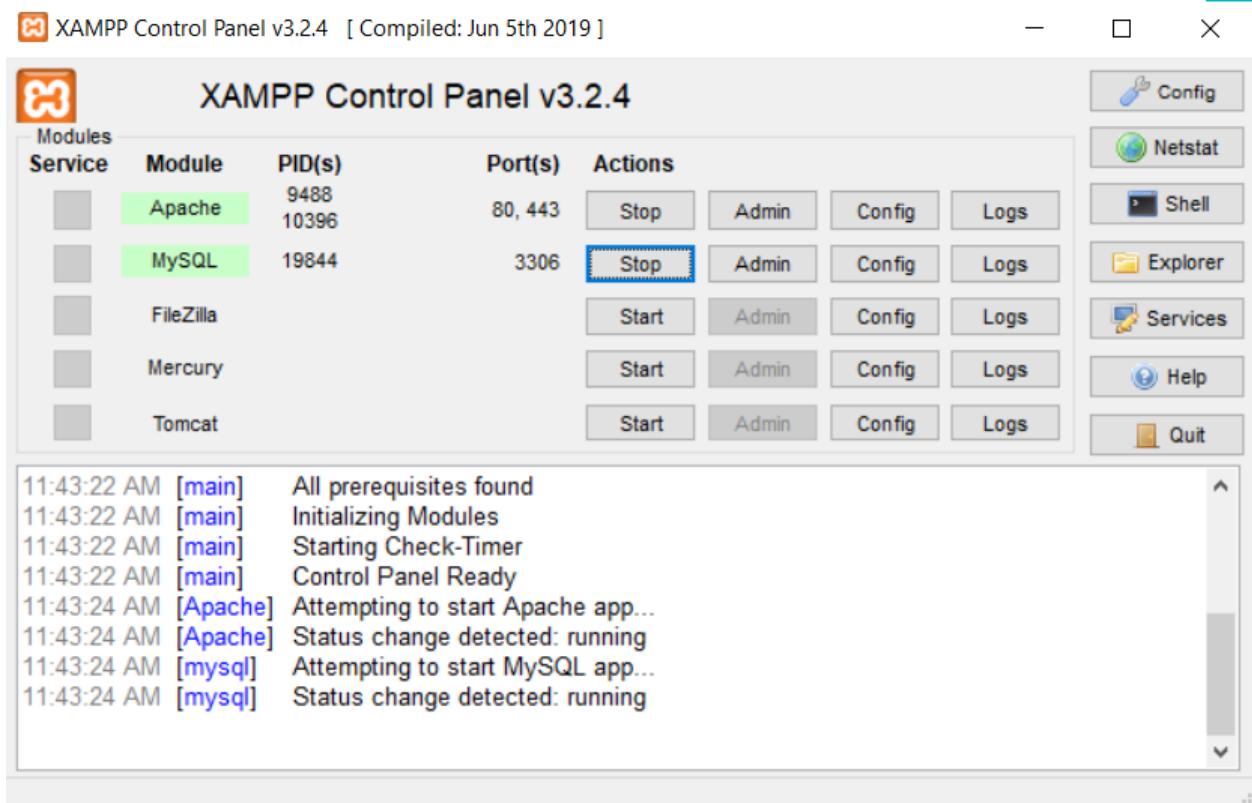
Relationship Schema



ER Diagram



Building Process



Firstly, we had to set up a website for our database system. For this purpose, we used two essential components of XAMPP- Apache and MySQL. Apache is used to create a local server, and MySQL is used as a database for our website.

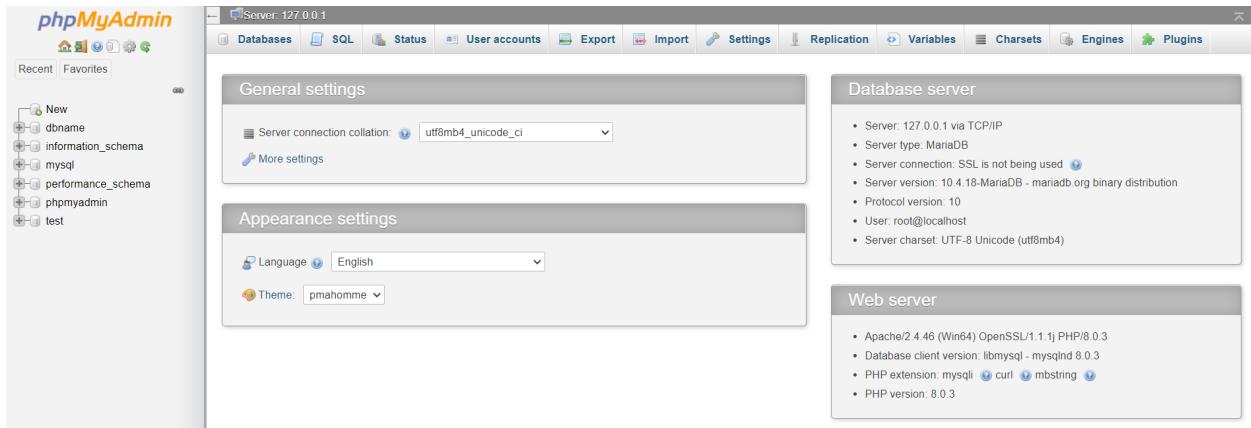
We installed XAMPP and started its Apache and MySQL servers. This allows us to build a website offline, on a local web server on our own computer.



Welcome to XAMPP for Windows 8.0.3

You have successfully installed XAMPP on this system! Now you can start using Apache, MariaDB, PHP and other components. You can find more info in the [FAQs](#) section or check the [HOW-TO Guides](#) for getting started with PHP applications.

After successfully setting up our XAMPP localhost, we can now navigate to the phpMyAdmin tool through it, where we will be setting up our database environment.



The phpMyAdmin interface looks like this. Here, we can finally set up a new database for our project and add its various constituent tables and their own attributes.

After adding the SQL code to SQL query interface provided by XAMPP, a database is created *government database*, and we end up with all our tables with their respective attributes defined as planned, so our database is up and running

Table	Action	Rows	Type	Collation	Size	Overhead
aadhar	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
army	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
citizen	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
dmv	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
govwork	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
pan	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
passport	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
property	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-
users	Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	16.0 Kib	-
visa	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 Kib	-

10 tables Sum 12 InnoDB utf8mb4_general_ci 304.0 Kib 0 B

Check all With selected

Print Data dictionary

Create table

Name: Number of columns:

Console

With this setup, we can finally set up a simple website to enable us to use the database as intended.

We use **Bootstrap** and **PHP** to create a simple website that is connected to our database , where we can register users, and their various governmental information to their respective tables.

For example, we can register a user , whose information will be stored in the *users* table, and use this to login with the setup password and email ID. Then we can choose one of the many services provided on the page to register important information about government offered services for the user and connect that to the database to store that information.

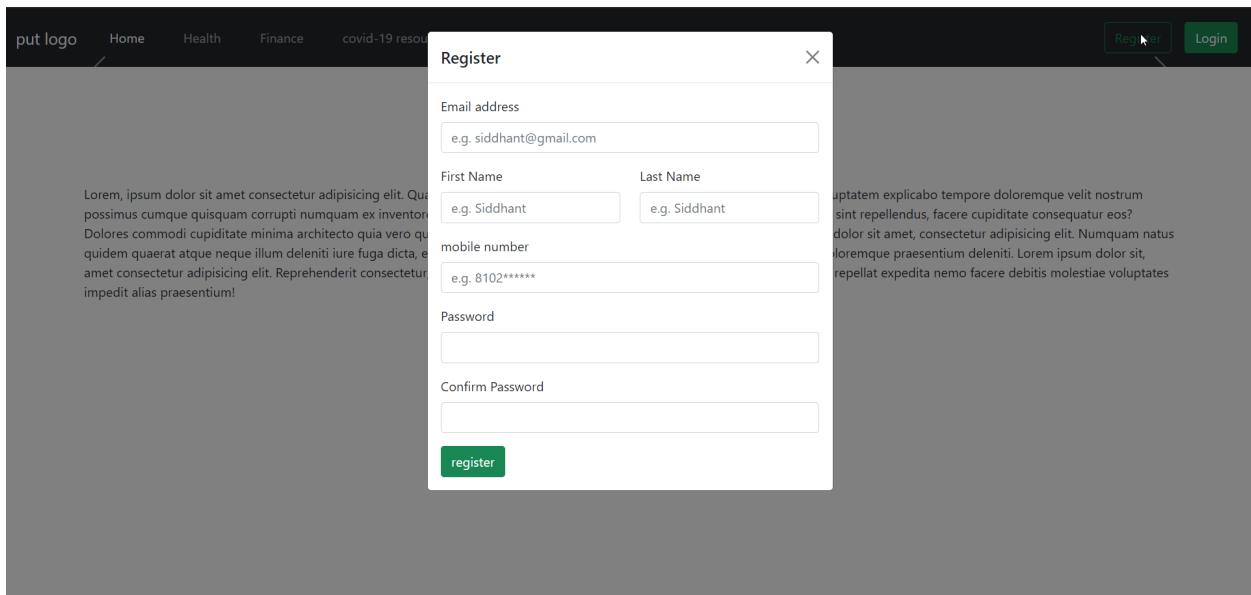


Fig. Register Modal

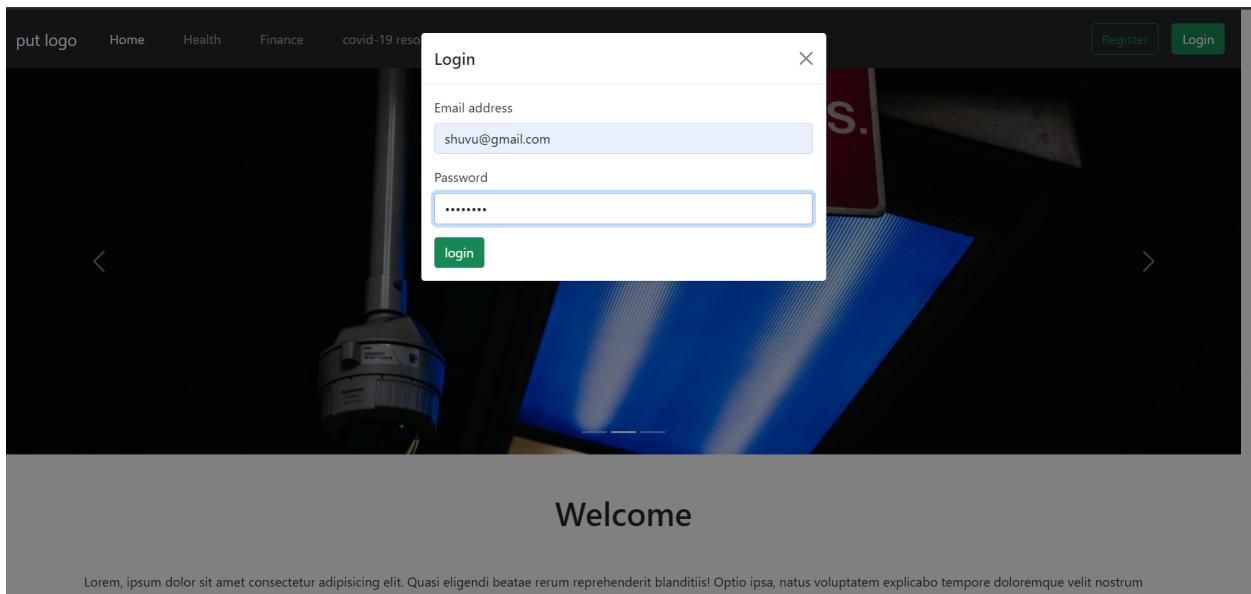


Fig. Login page (we also used hashing for password)

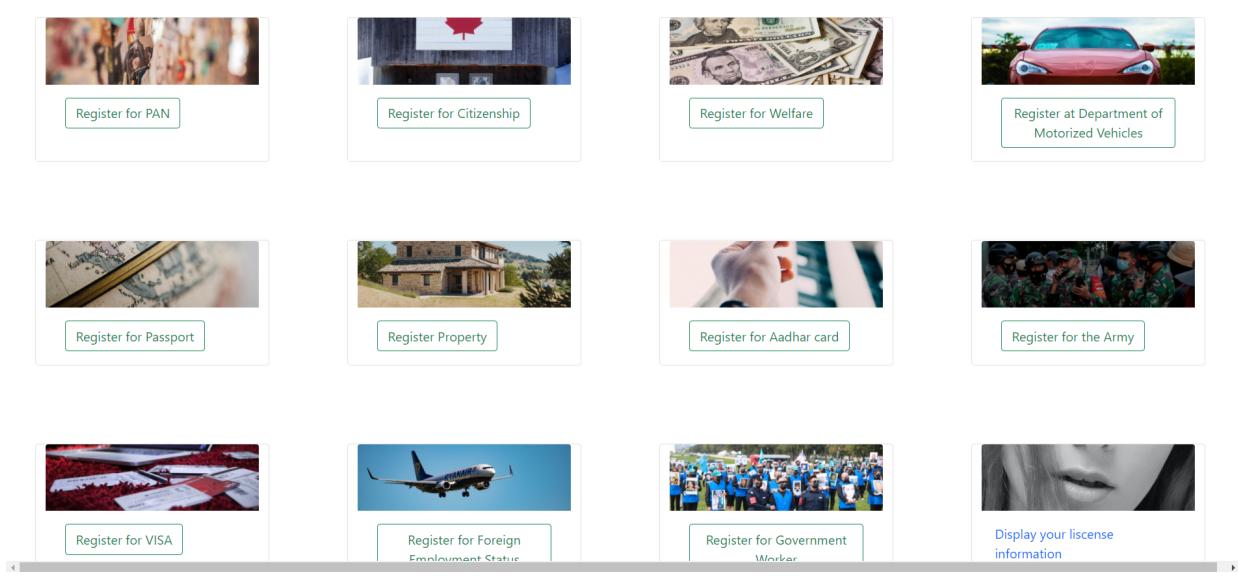


Fig. Provided Services to Register

Register for VISA X

VISA UNIQUE NUMBER
6 digit number please

Email address
e.g. siddhant@gmail.com

First Name Last Name
e.g. Siddhant e.g. Siddhant

Mobile Number
e.g. 8102*****

Country Visiting
e.g. Nepal

Reason For Visitng
e.g. Studies, Family

Submit

Fig. VISA service registration

Through the use of sql queries, we were able to use the data in the database to maintain unique users, display information from across multiple tables, and insert information with ease.

Email address

Go!

These are your details

Name : Thak
 Citizenship Number : 2147483647
 Address : bagdol
 Mobile Number : 15190542
 VISA Number : 123456
 PAN Number : 12345678
 Passport Number : 1234567890
 Government Employee Number : 2147483647
 Army Number : 1234567
 Army Branch : Air Force
 Property No : 12345678
 Property Area : vijay nagar
 Aadhar Card Number : 2147483647

Fig. Display Information across multiple tables.

SQL Code

```
CREATE TABLE users
(
    emailID VARCHAR(255) NOT NULL,
    firstName INT NOT NULL,
    mobNo INT NOT NULL,
    lastName INT NOT NULL,
    password INT NOT NULL,
    PRIMARY KEY (emailID)
);
```

```
CREATE TABLE VISA
```

- (

```
    firstName VARCHAR NOT NULL,  
    lastName VARCHAR NOT NULL,  
    country VARCHAR NOT NULL,  
    reason VARCHAR NOT NULL,  
    Phone INT NOT NULL,  
    visaNo INT NOT NULL,  
    emailID VARCHAR(255) NOT NULL,  
    PRIMARY KEY (visaNo),  
    FOREIGN KEY (emailID) REFERENCES User(emailID)  
);
```

```
CREATE TABLE passport  
(  
    firstName TEXT NOT NULL,  
    lastName TEXT NOT NULL,  
    address TEXT NOT NULL,  
    passport_Number INT NOT NULL,  
    emailID VARCHAR(255) NOT NULL,  
    PRIMARY KEY (passportNo),  
    FOREIGN KEY (emailID) REFERENCES User(emailID)  
);
```

```
CREATE TABLE citizen  
(  
    firstName TEXT NOT NULL,  
    lastName TEXT NOT NULL,  
    address TEXT NOT NULL,  
    citizenshipNo INT NOT NULL,  
    emailID VARCHAR(255) NOT NULL,
```

```
PRIMARY KEY (citizenshipNo),  
FOREIGN KEY (emailID) REFERENCES User(emailID)  
) ;
```

```
CREATE TABLE dmv  
(  
    firstName TEXT NOT NULL,  
    lastName TEXT NOT NULL,  
    licenseNo INT NOT NULL,  
    bloodgrp VARCHAR(4) NOT NULL,  
    address text NOT NULL,  
    emailID VARCHAR(255) NOT NULL,  
    PRIMARY KEY (licenseNo),  
    FOREIGN KEY (emailID) REFERENCES User(emailID)  
) ;
```

```
CREATE TABLE pan  
(  
    firstName VARCHAR NOT NULL,  
    lastName VARCHAR NOT NULL,  
    fatherName VARCHAR NOT NULL,  
    panNo INT NOT NULL,  
    emailID VARCHAR(255) NOT NULL,  
    PRIMARY KEY (panNO),  
    FOREIGN KEY (emailID) REFERENCES User(emailID)  
) ;
```

```
CREATE TABLE aadhar  
(
```

```
    firstName TEXT NOT NULL,  
    lastName TEXT NOT NULL,  
    aadharNo INT NOT NULL,  
    gender VARCHAR NOT NULL,  
    emailID VARCHAR(255) NOT NULL,  
    PRIMARY KEY (aadharNo),  
    FOREIGN KEY (emailID) REFERENCES User(emailID)  
);
```

```
CREATE TABLE govwork  
(  
    firstName TEXT NOT NULL,  
    lastName TEXT NOT NULL,  
    employeeID INT NOT NULL,  
    job VARCHAR NOT NULL,  
    emailID VARCHAR(255) NOT NULL,  
    PRIMARY KEY (employeeID),  
    FOREIGN KEY (emailID) REFERENCES User(emailID)  
);
```

```
CREATE TABLE property  
(  
    address VARCHAR NOT NULL,  
    area VARCHAR NOT NULL,  
    ownerfirstName TEXT NOT NULL,  
    ownerlastName TEXT NOT NULL,  
    mobNo INT NOT NULL,  
    propertyID INT NOT NULL,  
    emailID VARCHAR(255) NOT NULL,
```

```

    PRIMARY KEY (propertyID),
    FOREIGN KEY (emailID) REFERENCES User(emailID)
);

```

```

CREATE TABLE army
(
    armyID INT NOT NULL,
    firstName TEXT NOT NULL,
    lastName TEXT NOT NULL,
    bloodgrp VARCHAR(4) NOT NULL,
    branch VARCHAR NOT NULL,
    emailID VARCHAR(255) NOT NULL,
    PRIMARY KEY (armyID),
    FOREIGN KEY (emailID) REFERENCES User(emailID)
);

```

```

SELECT *
FROM users
INNER JOIN citizen ON users.email = citizen.email
INNER JOIN passport ON users.email = passport.email
INNER JOIN aadhar ON users.email = aadhar.email
INNER JOIN army ON users.email = army.email
INNER JOIN visa ON users.email = visa.email
INNER JOIN pan ON users.email = pan.email
INNER JOIN govwork ON users.email = govwork.email
INNER JOIN dmv ON users.email = dmv.email
INNER JOIN property ON users.email = property.email
AND users.email = '$email'

```

Database Info and Attributes

5/30/2021

Print view - phpMyAdmin 5.1.0

government database

aadhar

Column	Type	Null	Default	Links to	Comments	Media type
aadharNo (<i>Primary</i>)	int(12)	No				
email	varchar(255)	No		users -> email		
firstName	text	No				
lastName	text	No				
gender	text	No				

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	aadharNo	1	A	No	
email	BTREE	No	No	email	1	A	No	

army

Column	Type	Null	Default	Links to	Comments	Media type
armyID (<i>Primary</i>)	int(10)	No				
email	varchar(255)	No		users -> email		
firstName	text	No				
lastName	text	No				
bloodgrp	varchar(4)	No				
branch	text	No				

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	armyID	1	A	No	
email	BTREE	No	No	email	1	A	No	

citizen

Column	Type	Null	Default	Links to	Comments	Media type
citizenshipNo (<i>Primary</i>)	int(12)	No				
email	varchar(255)	No		users -> email		
firstName	text	Yes	NULL			

5/30/2021

Print view - phpMyAdmin 5.1.0

lastName	text	Yes	NULL			
address	text	Yes	NULL			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	citizenshipNo	0	A	No	
email	BTREE	No	No	email	0	A	No	

dmv

Column	Type	Null	Default	Links to	Comments	Media type
licenseNo <i>(Primary)</i>	int(10)	No				
email	varchar(255)	No		users -> email		
firstName	text	No				
lastName	text	No				
bloodgrp	varchar(4)	No				
type	text	No				

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	licenseNo	1	A	No	
email	BTREE	No	No	email	1	A	No	

govwork

Column	Type	Null	Default	Links to	Comments	Media type
employeeID <i>(Primary)</i>	int(12)	No				
email	varchar(255)	No		users -> email		
firstName	text	Yes	NULL			
lastName	text	Yes	NULL			
job	text	Yes	NULL			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	employeeID	0	A	No	
email	BTREE	No	No	email	0	A	No	

pan

5/30/2021

Print view - phpMyAdmin 5.1.0

Column	Type	Null	Default	Links to	Comments	Media type
panNo (<i>Primary</i>)	int(9)	No				
email	varchar(255)	No		users -> email		
firstName	text	Yes	NULL			
lastName	text	Yes	NULL			
fatherName	text	Yes	NULL			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	panNo	1	A	No	
email	BTREE	No	No	email	1	A	No	

passport

Column	Type	Null	Default	Links to	Comments	Media type
passportNo (<i>Primary</i>)	int(11)	No				
email	varchar(255)	No		users -> email		
firstName	text	No				
lastName	text	No				
address	text	No				

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	passportNo	1	A	No	
email	BTREE	No	No	email	1	A	No	

property

Column	Type	Null	Default	Links to	Comments	Media type
propertyID (<i>Primary</i>)	int(9)	No				
ownerfirstName	text	No				
ownerlastName	text	No				
area	text	No				
email	varchar(255)	No		users -> email		
address	text	No				
mobNo	int(11)	No				

Indexes

5/30/2021

Print view - phpMyAdmin 5.1.0

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	propertyID	1	A	No	
email	BTREE	No	No	email	1	A	No	

users

Column	Type	Null	Default	Links to	Comments	Media type
email (<i>Primary</i>)	varchar(255)	No				
firstName	text	Yes	NULL			
lastName	text	Yes	NULL			
mobNo	int(11)	Yes	NULL			
password	varchar(255)	Yes	NULL			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	email	2	A	No	

visa

Column	Type	Null	Default	Links to	Comments	Media type
visanumber (<i>Primary</i>)	int(6)	No				
email	varchar(255)	No		users -> email		
firstName	text	Yes	NULL			
lastName	text	Yes	NULL			
mobNo	int(11)	Yes	NULL			
countryvisiting	text	Yes	NULL			
reasonvisiting	text	Yes	NULL			

Indexes

Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
PRIMARY	BTREE	Yes	No	visanumber	0	A	No	
email	BTREE	No	No	email	0	A	No	

Conclusion

This project has been a tremendous learning experience for us. We, in our research, were introduced to a plethora of resources available for database management, as well as web site design.

This was a fun project to build and it can be used to inspire and encourage the usage of SQL, database management techniques, and web design elements.

References

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