A Complete Form with Database Connectivity

A project report submitted in the partial fulfillment of the requirements for the

Award of the degree of

BACHELOR OF TECHNOLOGY

In

Computer Science and Engineering

Submitted By

ALLA DHEERAJ KUMAR

Reg.no: 121910319020

Under the Guidance of Mr. A K Sai Charan

24 June 2022

DECLARATION BY THE CANDIDATE

I the undersigned solemnly declare that the project report of the A Complete Form with database connectivity is based on my own work carried out during the course of our study under the supervision of Mr. A K Sai Charan. I assert the statements made and conclusions drawn are an outcome of my research work. I further certify that

I. The work contained in the report is original and has been done by me under the general supervision of my supervisor.
II. The work has not been submitted to any other institution for any other degree/diploma/certificate in this university or any other University of India or abroad.
III. We have followed the guidelines provided by the university in writing the report.
IV. Whenever we have used materials (data, theoretical analysis, and text) from other sources, we have given due credit to them in the text of the report and giving their details in the references.

Alla Dheeraj Kumar

121910319020

PG-2223-ETSD-401

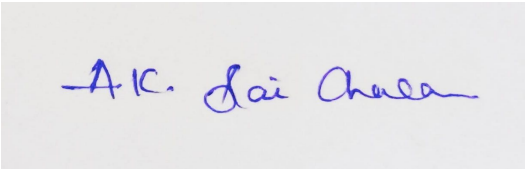
CERTIFICATE

This is to certify that this project work entitled

"A Complete Form with Database Connectivity"

is the Bonafede work carried out by Alla Dheeraj Kumar, Reg. No: 121910319020 submitted in Partial fulfillment of the requirement for the Award of Degree of Bachelor of Technology in Computer Science and Engineering, during June-July 2022.

The results submitted in this project have been verified and are found to be satisfactory. The results embodied in this thesis have not been submitted to any other university for the award of the any other degree/diploma.



Signature of project supervisor

ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mention of people who made it possible, whose constant guidance and encouragement crowned the efforts with success. It is a pleasant aspect that I have now the opportunity to express my gratitude for all of them.

The first person I would like to thank my project guide Mr. A K Sai Charan, who had given continuous critical suggestions and extension of proper working atmosphere, abiding interest has finally evolved into this research work.

I would like to express my sincere thanks to Prof. Sireesha R, Head of the Department of Computer Science and engineering for providing the opportunity to Undertake this internship and encouragement in the completion of the project.

I am also thankful to all the staff members of the Computer Science and Engineering Department for their valuable suggestions. I would like to thank my team mates and parents who extended their help, encouragement and moral support either directly or indirectly in this project.

Alla Dheeraj Kumar

121910319020

CONTENTS

ABSTRACT

A Registration Form with complete Database connectivity using MEAN stack.

MEAN Stack is one of the most popular Technology Stack. It is used to develop a Full Stack Web Application. Although it is a Stack of different technologies, all of these are based on JavaScript language.

MEAN Stands for:

1. **M** – MongoDB
2. **E** – Express
3. **A** – Angular
4. **N** – Node.js

A Stack is a collection of software technology that is packed together to form a platform. A stack is like a collection of tools that can be used to solve a problem. In this case, a MEAN stack solves a recurring problem in programming

Angular acts as the MEAN stack's web frontend, receiving requests from a user's browser. Angular passes this request to Express, which passes it to Node. Node retrieves the object from the MongoDB database, without having to translate the object at any point, because it's in a JSON format running through all JavaScript components.

MEAN is an open source web stack that is mainly used to create cloud-hosted applications. MEAN stack applications are flexible, scalable, and extensible, making them the perfect candidate for cloud hosting. The stack includes its own web server so it can be deployed easily,

and the database can be scaled on demand to accommodate temporary usage spikes. A MEAN application enters the world optimized to take advantage of all the cost savings and performance improvements of the cloud.

Advantages of using MEAN Stack:

1. Open Source

MEAN Stack is a cost-effective alternative because all of the platforms are open-source, including MongoDB, Express.js, Angular.js, and Node.js.

2. Cloud Integration

MongoDB is the greatest database system because it allows you to develop, test, and host apps on the cloud, saving you money on disc space.

3. Quality user interfaces

MEAN stack supports the MVC (Model View Controller) architecture, which results in high-quality user interfaces.

4. Excellence in JAVA

MEAN Stack developers will write the complete code in JavaScript because it is a common language for both client and server-side applications.

5. Single page applications

Developers may use Angular.JS to add AJAX-driven components and functions to the client-side, making it easier to design, test, and maintain SPAs.

6. Flexibility

MEAN Stack allows you to develop code in Node and then easily migrate it to AngularJS. MEAN-based apps are substantially easier to program thanks to this flexibility.

7. No SQL MongoDB's NoSQL nature allows you to change and alter the data layer easily without having to worry about migrations.

ABOUT

Phoenix Global is a skill-development company that helps students acquire and master professional and soft skills as per the requirements of the industry benchmarked to world's top firms, trained by top class industry professionals.

Phoenix Global is a platform having Industry professionals with esteemed alma mater including the IITs and IIMs to mentor and train students on cutting-edge skills, critical to the emerging industries while also giving them an opportunity to intern on a project under the mentorship of industry professionals from the IITs /IIMs.

Our vision is to be a national leader in skill development and industry readiness training by providing differentiated training from top-class industry experts. The mission is to be a go-to skill development platform for students, imparting skills benchmarked at global standards that help them realize their dream careers profitably

Our core values, the 4Ps – Professionalism, Punctuality, Passion, Perseverance stand for who and what we are as an organization.

SCHEDULE OF INTERNSHIP

Day	Activity Plan
1	Induction Program
2	Pre-Readings/Material Distribution
3	Training Session - 1
4	Training Session - 2
5	Training Session - 3
6	Training Session - 4
7	Training Session - 5
8	Teams formation for Project
9	Weekend Off
10	Training Session - 6
11	Training Session - 7
12	Training Session - 8
13	Training Session - 9
14	Training Session - 10
15	Project Title Allocation
16	Weekend Off
17	Project Session - 1
18	Project Session - 2
19	Project Session - 3
20	Project Session - 4
21	Project Session - 5
22	Project Mid Review
23	Weekend Off
24	Project Session - 6
25	Project Session - 7
26	Project Session - 8
27	Project Session - 9
28	Project Session - 10
29-44	Project Working Sessions
45	Project Final Presentation and Thesis Defense

UI Technologies

HTML: HTML stands for Hyper Text Markup Language. It is used to design web pages using the markup language. HTML is the combination of Hypertext and Markup language. Hypertext defines the link between the web pages and markup language defines the text document within the tag that define the structure of web pages. HTML is used to create the structure of web pages that are displayed on the World Wide Web (www). It contains Tags and Attributes that are used to design the web pages. Also, we can link multiple pages using Hyperlinks. Html can be written on any text editor

Structure of HTML:

```
<html>
 <head>
 <title>Example</title>
 </head>
 <body>
 <h1>Hello, World! </h1>
 <p>This is  Dheeraj Documentation</p>
 </body>
</html>
```

CSS: CSS stands for Cascading Style Sheets. The primary intention of CSS is to separate visual presentation from document content written in markup language. CSS describes how HTML elements are to be displayed on screen, paper, or in other media. CSS saves a lot of work. It can control the layout of multiple web pages all at once. Styles are added to static html document

JavaScript: JavaScript is the world most popular lightweight, interpreted compiled programming language. It is also known as scripting language for web pages. It is well-known for the development of web pages, many non-browser environments also use it. JavaScript can be used for Client-side developments as well as Server-side developments.

JavaScript can be added to your HTML file in two ways:

- **Internal JS:** We can add JavaScript directly to our HTML file by writing the code inside the <script> tag. The <script> tag can either be placed inside the <head> or the <body> tag according to the requirement.
- **External JS:** We can write JavaScript code in other file having an extension .js and then link this file inside the <head> tag of the HTML file in which we want to add this code.

Syntax:

```
<script>
    // JavaScript Code
</script>
```

Bootstrap: It is an open-source and free CSS framework, which helps in directing a responsive device-friendly mobile-first front-end web page development tool. Bootstrap includes the CSS (Cascading Style Sheets), and an optional JavaScript supported design template (plug-ins) that deals with typography, implementation of buttons, forms, and various other components user interface. This framework helps in faster web development and supports developers in creating responsive web pages faster. We can download and install bootstrap from bootstrap website easily

Jquery:

jQuery is an open-source JavaScript library that simplifies the interactions between an HTML/CSS document, or more precisely the Document Object Model (DOM), and JavaScript. Elaborating the terms, it simplifies HTML document traversing and manipulation, browser event handling, DOM animations, Ajax interactions, and cross-browser JavaScript development.

Some of the key points that support the answer for why to use jQuery:

- It helps us to manipulate HTML and CSS
- It helps us to manipulate DOM (Document Object Model) elements
- Provides event methods to trigger and respond to an events on a html page such as mouse click, keypress etc.
- Implements AJAX calls.

Installation:

You can download latest version of jQuery on your web server and include the downloaded library in your code. We suggest you to download compressed version of the library for a better performance.

- Go to the https://jquery.com/download/ to download the latest version available.
- Now put downloaded **jquery-3.6.0.min.js** file in a directory of your website, e.g. /jquery/**jquery-3.6.0.js**.
- Finally include this file in your HTML markup file as shown below.

Mongo DB

Mongo DB is the most popular NoSQL database, is an open-source document-oriented database. The term 'NoSQL' means 'non-relational'. It means that MongoDB isn't based on the table-like relational database structure but provides an altogether different mechanism for storage and retrieval of data. This format of storage is called BSON (similar to JSON format).

A simple MongoDB document Structure:

```
{
 title: 'dheerajsdocument',
 by: 'DheerajAlla',
 url: 'https://www.dheerajkumarorg.com',
 type: 'NoSQL'
}
```

CRUD:

CRUD operations describe the conventions of a user-interface that let users view, search, and modify parts of the database.

MongoDB documents are modified by connecting to a server, querying the proper documents, and then changing the setting properties before sending the data back to the database to be updated. CRUD is data-oriented, and it's standardized according to HTTP action verbs.

When it comes to the individual CRUD operations:

- The Create operation is used to insert new documents in the MongoDB database.
- The Read operation is used to query a document in the database.
- The Update operation is used to modify existing documents in the database.
- The Delete operation is used to remove documents in the database.

Create Operation:

MongoDB provides two different create operations that you can use to insert documents into a collection:

- db.collection.insertOne()
- db.collection.insertMany()

Read Operations:

MongoDB has two methods of reading documents from a collection:

- db.collection.find()
- db.collection.findOne()

Update Operations:

For MongoDB CRUD, there are three different methods of updating documents:

- db.collection.updateOne()
- db.collection.updateMany()
- db.collection.replaceOne()

Delete Operations:

Delete operations operate on a single collection, like update and create operations. Delete operations are also atomic for a single document. You can provide delete operations with filters and criteria in order to specify which documents you would like to delete from a collection. The filter options rely on the same syntax that read operations utilize.

MongoDB has two different methods of deleting records from a collection:

- db.collection.deleteOne()
- db.collection.deleteMany()

Express JS

Express is a minimal and flexible Node.js web application framework that provides a robust set of features to develop web and mobile applications. It facilitates the rapid development of Node based Web applications. Following are some of the core features of Express framework −

- Allows to set up middle wares to respond to HTTP Requests.
- Defines a routing table which is used to perform different actions based on HTTP Method and URL.
- Allows to dynamically render HTML Pages based on passing arguments to templates.

Installing Express

Firstly, install the Express framework globally using NPM so that it can be used to create a web application using node terminal.

npm install express –save

Following is a very basic Express app which starts a server and listens on port 8081 for connection. This app responds with **Hello World!** for requests to the homepage. For every other path, it will respond with a **404 Not Found.**

```
var express = require('express');

var app = express();

app.get('/', function (req, res) {

  res.send('Hello World'); })

var server = app.listen(8081, function () {

  var host = server.address().address
```

```
  var port = server.address().port
  console.log("Example app listening at http://%s:%s", host, port) })
```

Request & Response

Express application uses a callback function whose parameters are **request** and **response** objects.

```
app.get('/', function (req, res) {
// --
})
```

Some of the core features of Express framework:

- It can be used to design single-page, multi-page and hybrid web applications.
- It allows to setup middle wares to respond to HTTP Requests.
- It defines a routing table which is used to perform different actions based on HTTP method and URL.
- It allows to dynamically render HTML Pages based on passing arguments to templates.

Angular

Angular is an open-source JavaScript framework written in TypeScript. Google maintains it, and its primary purpose is to develop single-page applications. As a framework, Angular has clear advantages while also providing a standard structure for developers to work with. It enables users to create large applications in a maintainable manner.

Sample program in angular

```
<!DOCTYPE html>
<html lang="en-US">
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.9/angular.min.js"></script>
<body>
<div ng-app="">
  <p>Name: <input type="text" ng-model="name"></p>
  <h1>Hello {{name}}</h1>
</div>
</body>
</html>
```

Module:

An AngularJS module defines an application.

The module is a container for the different parts of an application.

The module is a container for the application controllers.

Controllers always belong to a module.

Eg:

```
<div ng-app="myApp">...</div>
<script>
var app=angular.module("myApp",[]);
</script>
```

Directive:

AngularJS has a set of built-in directives which you can use to add functionality to your application

AngularJS directives are extended HTML attributes with the prefix ng-.

The ng-app directive initializes an AngularJS application.

The ng-init directive initializes application data.

The ng-model directive binds the value of HTML controls (input, select, textarea) to application data.

Sample Program:

```
<div ng-app="" ng-init="firstName='Dheeraj'">

<p>Name: <input type="text" ng-model="firstName"></p>
<p>name: {{firstName}}</p>

</div>
```

Two Way DataBinding:

It is one of the feature of angular framework which makes it a easier to deal with by the beginers

In the next example two text fields are bound together with two ng-model directives:

Example

```
<div ng-app="" ng-init="value:1,price=5">

Quantity: <input type="number" ng-model="quantity">
Costs:    <input type="number" ng-model="price">

Totalindollar: {{Value*price}}

</div>
```

Advantages of Angular

Angular has come a long way since 2012. There are benefits to using the framework and there are some drawbacks as well, especially if you are a beginner. Let us talk about the good things first.

Maintained by Google

The best things about Angular is that it is developed and maintained by Google. As it is backed by a trusted company, trust is well established within the community. Developers believe in the framework and in the fact that it will be maintained, and issues will be resolved, of course with the help of community contributions.

Large community and ecosystem

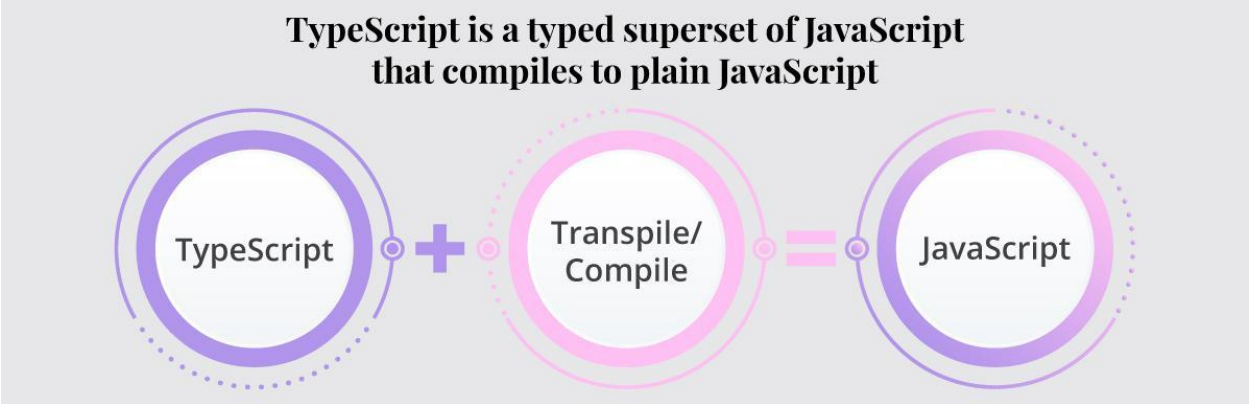
Angular is actively maintained and has a large community and ecosystem. You can find lots of material on this framework as well as many useful third-party tools. Currently, Angular has around over 63K stars on GitHub, a clear indication of the popularity of the framework.

Two-way Data binding

Two-way data binding in Angular will help users to exchange data from the component to view and from view to the component. It will help users to establish communication bi-directionally. Two-way data binding can be achieved using a ng Model directive in Angular. This ensures that the model and the view are always kept in sync without any extra effort.

Use of TypeScript

Angular opted for TypeScript as the primary programming language. TypeScript adds a lot of syntactic sugar to JavaScript. With TypeScript, we also get several productivity benefits. In editors like VS Code and WebStorm, we have access to robust code help (intellisense) as we type, making it easier to discover types, the features they offer, and most importantly the common syntactical errors.



TypeScript is a typed superset of JavaScript that compiles to plain JavaScript

Powerful Router

Routing or in-app navigation in Angular is taken care of by the Angular Router. It is a module available in the @angular/router package. Angular router is a very powerful and flexible navigational service. It uses a component called router-outlet to load various components into the view depending upon the URL in the browser.

Angular Router has built-in support for lazy loading components, so the modules are loaded from the server as the user navigates within the app. Huge apps have a lot of benefits because of this feature.

Availability of packages

There is a huge repository of open-source packages available for Angular developers. Some of the most important packages are Ng Bootstrap, Angular Google Maps, NgRx, NgTranslate, AngularFire, NgxTextEditor, Angular Material, Ng2 Pdf Viewer, NgxCharts, and many more. Some of these packages are maintained by the official Angular team and most of these are taken care of by the community of developers as well. It is most likely that if you are looking to build a complex feature or a component for your application, a package already exists for you, so why reinvent the wheel?

Node

Node.js is a server-side platform built on Google Chrome's JavaScript Engine (V8 Engine). Node.js was developed by Ryan Dahl in 2009 and its latest version is v0.10.36. The definition of Node.js as supplied by its official documentation is as follows −

Node.js is a platform built on Chrome's JavaScript runtime for easily building fast and scalable network applications. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient, perfect for data-intensive real-time applications that run across distributed devices.

Node.js is an open source, cross-platform runtime environment for developing server-side and networking applications. Node.js applications are written in JavaScript, and can be run within the Node.js runtime on OS X, Microsoft Windows, and Linux.

Node.js also provides a rich library of various JavaScript modules which simplifies the development of web applications using Node.js to a great extent.

Node.js = Runtime Environment + JavaScript Library

Following are the areas where Node.js is proving itself as a perfect technology partner.

- I/O bound Applications
- Data Streaming Applications
- Data Intensive Real-time Applications (DIRT)
- JSON APIs based Applications
- Single Page Applications

Node Package Manager:

Node Package Manager (NPM) is a command line tool that installs, updates or uninstalls Node.js packages in your application. It is also an online repository for open-source Node.js packages. The node community around the world creates useful modules and publishes them as packages in this repository.

For eg:

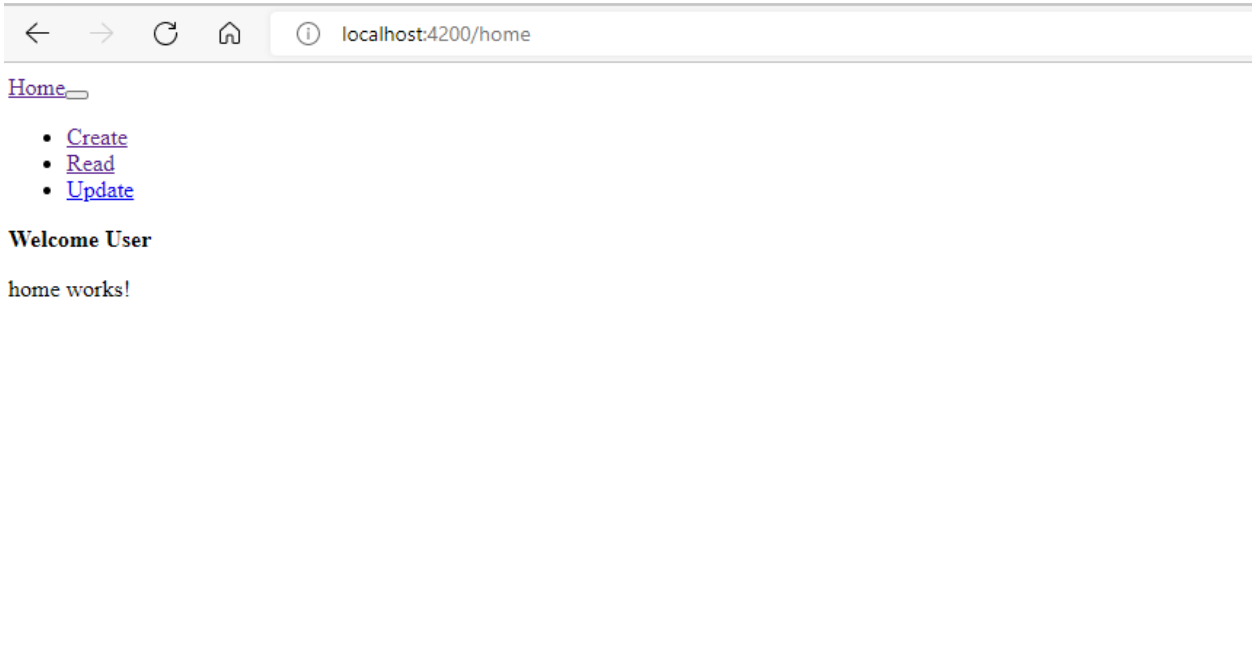
npm install

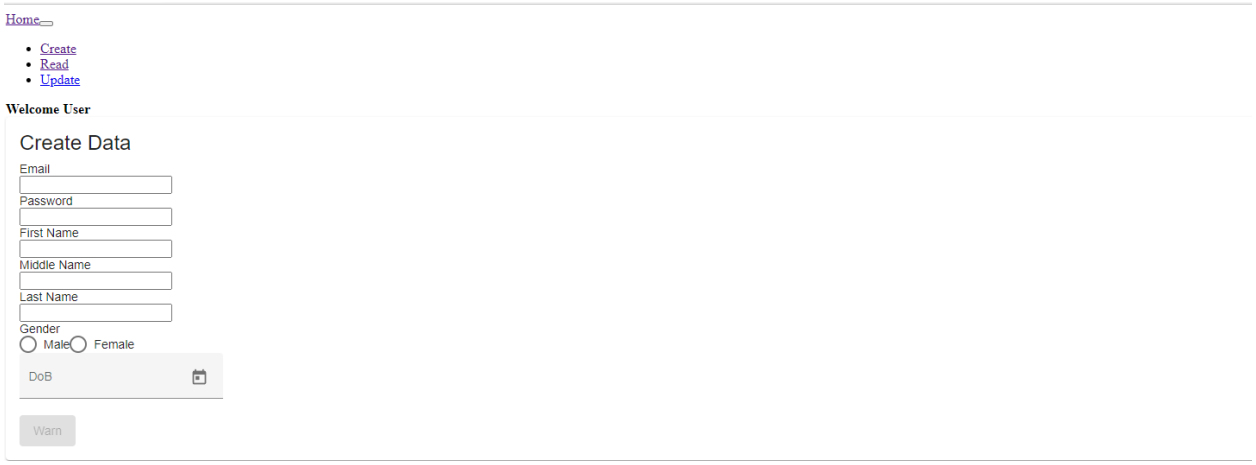
NPX: The npx stands for Node Package Execute and it comes with the npm, when you installed npm above 5.2.0 version then automatically npx will installed. It is an npm package runner that can execute any package that you want from the npm registry without even installing that package.

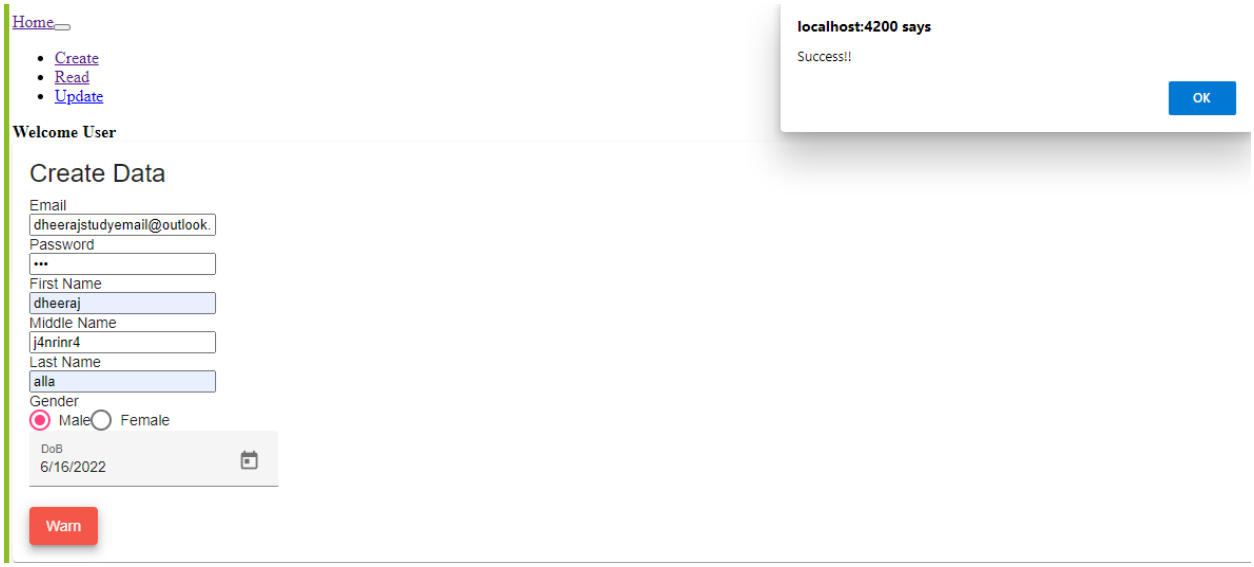
Eg:

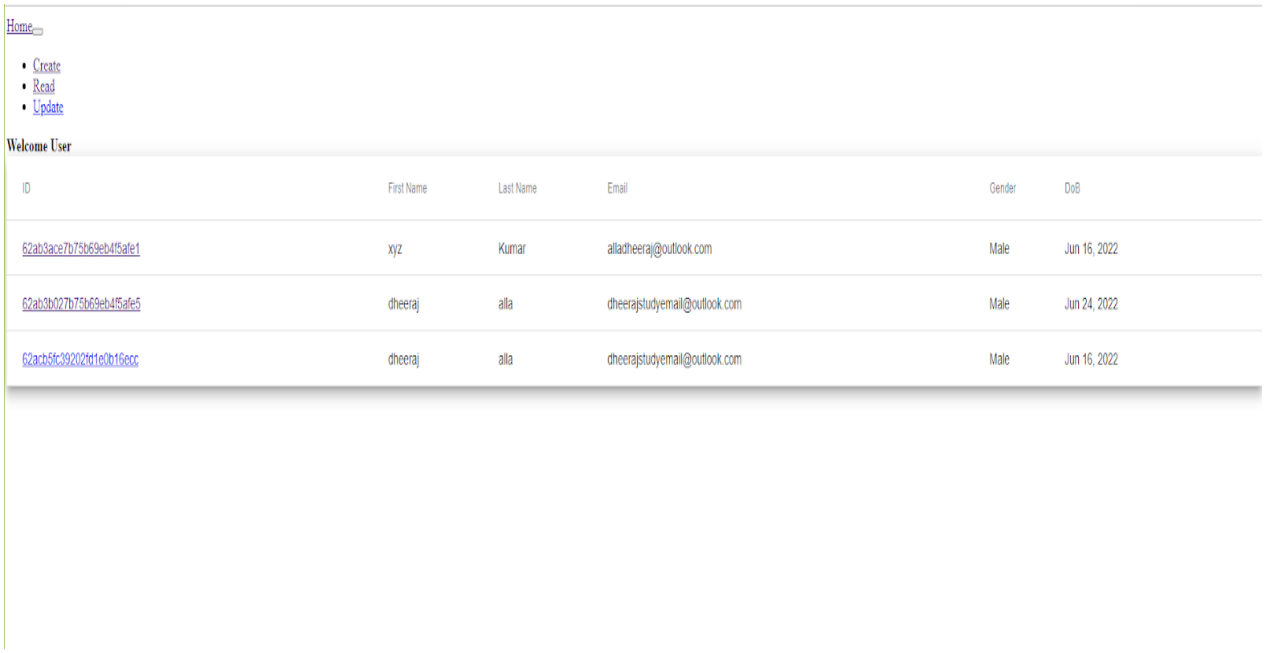
npx nodemon app.js

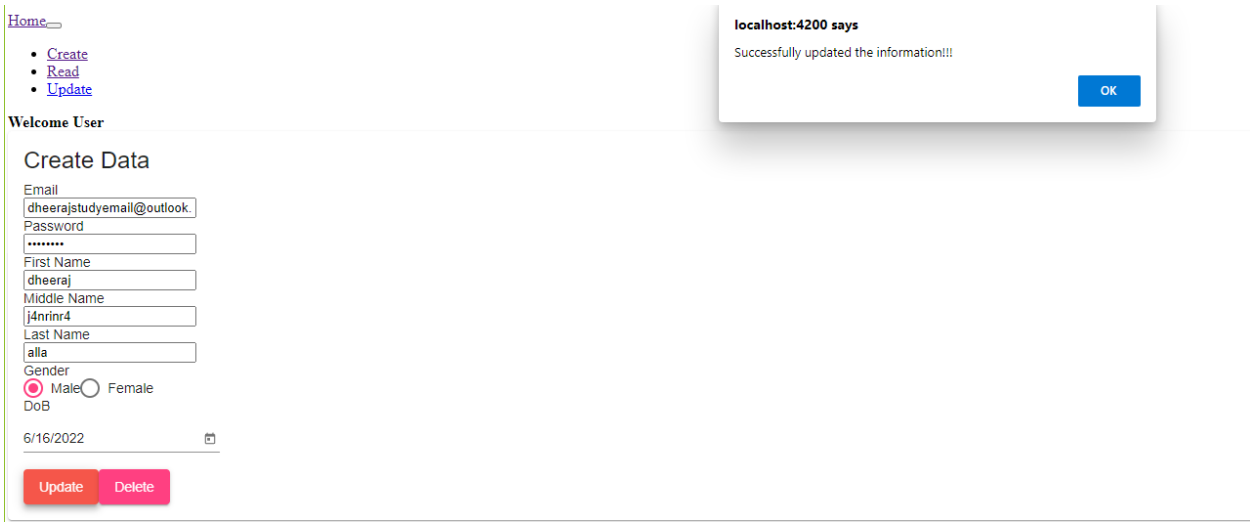
Conclusion and Output

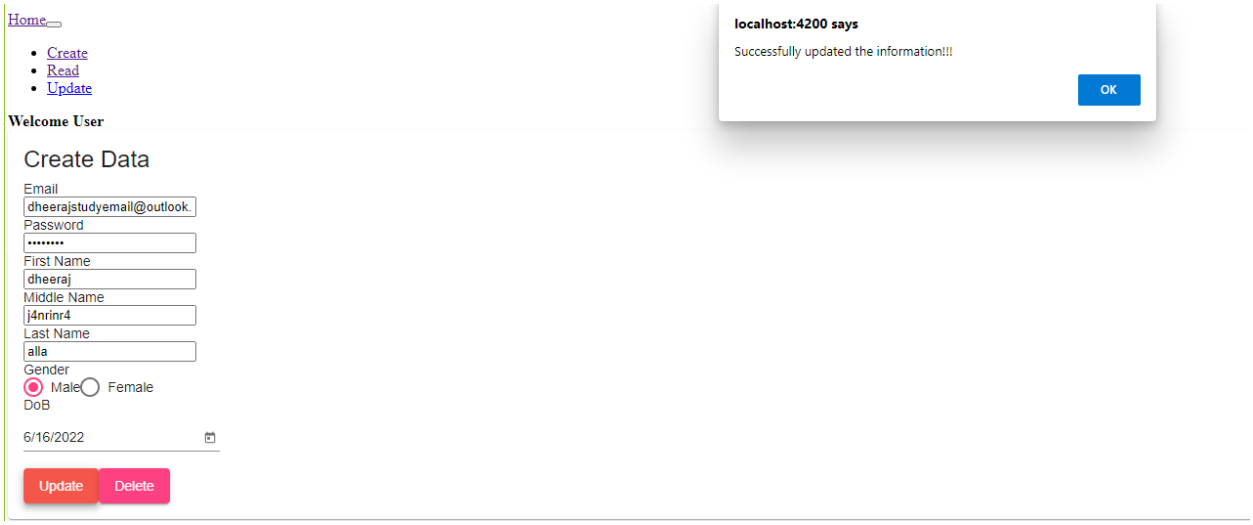





Home
Create
Read
Update
Welcome User
Create Data
Email
dheerajstudyemail@outlook.
Password
First Name
dheeraj
Middle Name
j4nrinr4
Last Name
alla
Gender
Male
Female
DoB
6/16/2022
Warn
localhost:4200 says
Success!!
OK


Home
Create
Read
Update
Welcome User
ID
First Name
Last Name
Email
Gender
DoB
62ab3ace7b75b69eb4f5afe1
xyz
Kumar
alladheeraj@outlook.com
Male
Jun 16, 2022
62ab3b027b75b69eb4f5afe5
dheeraj
alla
dheerajstudyemail@outlook.com
Male
Jun 24, 2022
62acb5fc39202fd1e0b16ecc
dheeraj
alla
dheerajstudyemail@outlook.com
Male
Jun 16, 2022


Home
Create
Read
Update
Welcome User
localhost:4200 says
Successfully updated the information!!!
OK
Create Data
Email
dheerajstudyemail@outlook.
Password
First Name
dheeraj
Middle Name
j4nrinr4
Last Name
alla
Gender
Male
Female
DoB
6/16/2022
Update
Delete



We successfully built a Responsive Registration form for a website with database connectivity by using MEAN stack along with HTML CSS and JavaScript. Our website takes in data and stores it in a database. The owner of the webpage will have full access to the content of the data. He/She can view and visualize the data according to his needs.

REFERENCES

1) https://www.mongodb.com/docs/
2) https://www.tutorialspoint.com/nodejs/index.htm
3) https://v2.angular.io/docs/
4) https://www.tutorialspoint.com/expressjs/index.html
5) UI Technologies from the material provided
6) Tools used: MongoDB compass, Angular ,visual studio code, compatible browser, Internet Connectivity