S2 FITNESS

A PROJECT REPORT

Submitted by

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DECLARATION

I hereby declare that the project entitled "S2 FITNESS" submitted for the B-Tech (CT) degree is my original work and the project has not formed the basis for the award of any degree, diploma, fellowship or any similar titles.

Signature of the student

Place :

Date :

CERTIFICATE

This is to certify that the project titled "S2 FITNESS" is the bona fide work carried out by Mr. Sahil , a student of B.Tech. (CSE) of CT institute of Engineering Management & Technology, Maqsudan (Jalandhar) affiliated to Punjab Technical University, Jalandhar , Punjab(India) during the academic year 2018-2022, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology (Computer Science and Engineering) and that the project has not formed the basis for the award previously of any other degree ,diploma , fellowship or any other similar title.

Signature of the Guide

Place :

Date :

ACKNOWLEDGEMENT

Through this acknowledgement, I express my sincere gratitude to all those people who have been associated with this project and have helped me with it and made it a worthwhile experience. First and foremost, I would like to express my gratitude to God for allowing me to complete this job successfully.

I wish to express our deep sense of gratitude and honor toward our Advisor, Prof. Manish and Inderpal Singh, for giving us a chance to work with this project.

Lastly, I would also like to thank my parents and friends who helped me a lot in finishing the project in a limited time.

I made this project not only for marks but also to increase my knowledge. Thanks again to all who helped me in the completion of this project.

COMPANY PROFILE

O7 Services is an **ISO 9001:2015**, **MSME PB10D0011152 and Govt. Authorised (CAL-C)** Company. They deal in Web Development, Mobile Application Development, Custom Software Development, UI/ UX Designing, Hosting services, Digital Marketing, Registration of Domain Names with the various latest extensions, AMC & MMC Services, Bulk sms and voice calls. They provide the most advanced IT solutions, supporting a full business cycle: preliminary consulting, system development, deployment, quality assurance and 24×7 support. With a rich experience of over 7 successful years, O7 Services tends to build long-lasting strategic partnerships with their clients to ensure affordable prices, timely delivery and measurable business results. Their Head Office is in Jalandhar and the Branch Office is in Hoshiarpur. Some of the products developed by O7 Services are- Vehicle Tracking System, Invoice Software, School Management System, Hospital Management system, Parents- Teacher Communication App, Fee Management system, Task Management System, Online Food Ordering App, Security App, Admission system, Inventory Software, Car Servicing App etc.

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CHAPTER: 1 INTRODUCTION

1.1 Project Overview

The “ Website" has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardships faced by this existing system.

- Our website is a gym and health club membership management system. You can keep records on your members, their memberships, and have quick and easy communication between you and your members. It also includes a booking system concessions and has a range of reports that help in the management of your club.

- Our website is a complete Fitness center and recreation facility system program which looks after all of your members, memberships and activities. It is designed for gyms, recreation centers, and health clubs.

- Our website provides lots of functions such data entry of customer, keeping records of all the things about customer’s fees, plan, and physical fitness which help to provide good quality of services to customer .

- The main objective of the Project on Website is to manage the details of Gym, Trainer, Member, Facility, Fitness Class. It manages all the information about Gym, Time Slot, Fitness

Class, Gym.

- The project is totally built at administrative end and thus only the administrator is guaranteed the access. The purpose of the project is to build an application program to reduce the manual work for managing the Gym, Trainer, Time Slot, Memeber. It tracks all the details about the Member, Facility, Fitness Class.

1.2 Project Modules and Specifications

Modules in the Project

- **Admin module-**:
  - Login
  - Manage Equipment
  - Manage Trainer
  - View member
  - View Paymemt
  - Manage products
  - Manage order
  - Access/Denail

- **Member module:**
  - Login to the system
  - Register
  - Edit profile
  - Place order
  - View Diet plan
  - View Report
  - Activity / workout plans
  - Pay online

- **Trainer module-**:
  - Manage Member
  - Daily updates
  - Member activity
  - Assign Diet plan

Functionality of Modules

- **Login:** User enters User Name and password to login this web application. There are two types of users that is Member and Trainer using this software . this application has further functions .

- **Admin:** This module has software configuration only admin can access this modules .Here admin adds new details, products, member ,trainer , admin details, etc. In this admin assigns tasks to member .Admin also provides unique username and password to the Trainer.

- **Entry:** Receptionist can add the details of a person who wish to join the center . Their persnal information including name ,email and phone number are collected. The receptionist also provides timings for that person, when he can come to the gym.

- **Gym equipment:** Admin has the authority to add the gym equipments to the software .He can also modify it.

- **Tasks:** Trainer has functionality of assign tasks to member and member can view that task in there id.

- **Product:** We provided with the list existing products. Here the user can view the details of products and can modify the existing products. This project even provides the facility of adding new Products.

CONCLUSION: This System allows the user to store the details, the details of person who is in the gym, gym equipment details etc. This software package allows storing the details of all the data related to gymnasium . In this also provide the trainer details and trainer can also assign tasks to the each member . The system is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain time of span. The implementation of the system in the organization will considerably reduce data entry, time and also provide readilycalculated reports.

SYSTEM REQUIREMENTS:

Hardware & Software Requirements

For this project minimum hardware and software requirement are listed below:

1.3 Hardware Requirements:

Processor	**:**	Intel I3
RAM	**:**	4.00 GB
Hard Disk	**:**	80 GB

1.4Software Requirements:

Front End Tool	**:**	Angular
Web Server	**:**	Express
Back End Tool	**:**	MongoDB/ Node.js
Browser	**:**	Chrome
Operating System	**:**	Windows Operating System/Linux

1.5 TECHNOLOGIES USED

HTML

HTML is the standard markup language for creating Web pages.

- HTML stands for Hyper Text Markup Language
- HTML describes the structure of Web pages using markup tags
- HTML elements are the building blocks of HTML pages
- HTML elements are represented by tags
- HTML tags label pieces of content such as "heading", "paragraph", "table", and so on

Syntax:-

<tag name>Content goes here...</tag name>

Structure of HTML Page:-

<html>

<head>

<title>…….</title>

</head>

<body>

</body>

</html>

HTML Tags:-

HTML tags are element names surrounded by angle brackets:

<tag name>content goes here...</tag name>

- HTML tags normally come **in pairs** like and
- The first tag in a pair is the **start tag,** the second tag is the **end tag**
- The end tag is written like the start tag, but with a **forward slash** inserted before the tagname.

Tag	**Meaning**
<html>…..</html>	Root element of an HTML page
<head>…..</head>	Meta information about the document
<title>……</title>	Specifies the title of the document
<body>….</body>	Defines the document body
<hi>…….</h1>	Display the Headings
……..	Defines a paragraph
…..	Applying alignment and style characteristics to only a section of a document
<img>	Display images on the web page. It is a empty tag
 	Defines a line break
<meta />	Data about data
<form>……</form>	Used for creating the form
<table>……</table>	Used for creating the tables

<tr>……</tr>	Creating the row of a table
<td>……</td>	Creating the columns
<img/>	Used for image
<a>…….	Used for linking the text, images etc.
……	Used for text size, color etc.

Properties:-

- New Doctype
- Email Inputs
- Video support
- Audio support
- Placeholders
- Divs

Advantages of HTML5

- Cleaner markup / Improved Code
- Consistency
- Fulfill the need of Web application
- Client-side database
- Relocation support

Disadvantages of HTML5

1. The primary issue with HTML5's acknowledgment is that just cutting edge programs bolster it.
2. Another issue is that in spite of the fact that parts of the dialect are exceptionally steady, the dialect itself is viewed as a work in advancement, so actually, any of the components could change whenever.
3. HTML5 does not have the adaptation control that the Apple and Google application stores give. Clients don't at present have a focal area from which they can look through and buy HTML5 applications.
4. Rather huge numbers of these applications need to depend on cash from promoting, which is essentially not as lucrative.

CSS :- Cascading style sheet

- CSS stands for Cascading Style Sheet.
- 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
- External style sheets are stored in CSS files

Selectors:-

- **The element Selector**
- The element selector selects elements based on the element name.
- You can select all <p> elements on a page like this (in this case, all <p> elements will be center-aligned, with a red text color):
- **Example**
- p {
  text-align: center;
  color: red;
  }

The id Selector

- The id selector uses the id attribute of an HTML element to select a specific element.
- The id of an element should be unique within a page, so the id selector is used to select one unique element!
- To select an element with a specific id, write a hash (#) character, followed by the id of the element.

- The style rule below will be applied to the HTML element with id="para1":

Applications of CSS

As mentioned before, CSS is one of the most widely used style language over the web. I'm going to list few of them here:

- **CSS saves time** - You can write CSS once and then reuse same sheet in multiple HTML pages. You can define a style for each HTML element and apply it to as many Web pages as you want.
- **Pages load faster** - If you are using CSS, you do not need to write HTML tag attributes every time. Just write one CSS rule of a tag and apply it to all the occurrences of that tag. So less code means faster download times.
- **Easy maintenance** - To make a global change, simply change the style, and all elements in all the web pages will be updated automatically.
- **Superior styles to HTML** - CSS has a much wider array of attributes than HTML, so you can give a far better look to your HTML page in comparison to HTML attributes.
- **Multiple Device Compatibility** - Style sheets allow content to be optimized for more than one type of device. By using the same HTML document, different versions of a website can be presented for handheld devices such as PDAs and cell phones or for printing.
- **Global web standards** - Now HTML attributes are being deprecated and it is being recommended to use CSS. So its a good idea to start using CSS in all the HTML pages to make them compatible to future browsers.

Three Ways to Insert CSS

There are three ways of inserting a style sheet:

- External CSS
- Internal CSS
- Inline CSS

External CSS

- With an external style sheet, you can change the look of an entire website by changing just one file!

- Each HTML page must include a reference to the external style sheet file inside the <link> element, inside the head section.

Example:-

```
<!DOCTYPE html>
<html>
<head>
<link rel="stylesheet" href="mystyle.css">
</head>
<body>
<h1>This is a heading</h1>
<p>This is a paragraph.</p>
</body>
</html>
```

An external style sheet can be written in any text editor, and must be saved with a .css extension.

The external .css file should not contain any HTML tags.

Internal CSS

- An internal style sheet may be used if one single HTML page has a unique style.
- The internal style is defined inside the <style> element, inside the head section.

Example :-

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
  background-color: linen;
}

h1 {
  color: maroon;
  margin-left: 40px;
}
</style>
</head>
<body>

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

Inline CSS

- An inline style may be used to apply a unique style for a single element.
- To use inline styles, add the style attribute to the relevant element. The style attribute can contain any CSS property.

Example:-

```
<!DOCTYPE html>
<html>
<body>
<h1 style="color:blue;text-align:center;">This is a
heading</h1>
<p style="color:red;">This is a paragraph.</p>
</body>
</html>
```

CSS Comments

- Comments are used to explain the code, and may help when you edit the source code at a later date.
- Comments are ignored by browsers.
- A CSS comment is placed inside the <style> element, and starts with /* and ends with */:

```
/* This is a single-line comment */
p {
  color: red;
}
```

CSS Backgrounds

The CSS background properties are used to define the background effects for elements.

CSS background properties:

- Background-color:
- Background-image:
- Background-repeat:
- Background-attachment:
- Background-position:

CSS3 Animations

- CSS3 animations allows animation of most HTML elements without using JavaScript or Flash!
- An animation lets an element gradually change from one style to another.
- You can change as many CSS properties you want, as many times you want.
- To use CSS3 animation, you must first specify some keyframes for the animation.
- Keyframes hold what styles the element will have at certain times.

The @keyframes Rule

- When you specify CSS styles inside the @keyframes rule, the animation will gradually change from the current style to the new style at certain times.

JavaScript

JavaScript is a lightweight, interpreted **programming** language. It is designed for creating network-centric applications. It is complimentary to and integrated with Java. **JavaScript** is very easy to implement because it is integrated with HTML. It is open and cross-platform.

Why to Learn Javascript

Javascript is a MUST for students and working professionals to become a great Software Engineer specially when they are working in Web Development Domain. I will list down some of the key advantages of learning Javascript:

- Javascript is the most popular **programming language** in the world and that makes it a programmer's great choice. Once you learnt Javascript, it helps you developing great front-end as well as back-end softwares using different Javascript based frameworks like jQuery, Node.JS etc.
- Javascript is everywhere, it comes installed on every modern web browser and so to learn Javascript you really do not need any special environment setup. For example Chrome, Mozilla Firefox , Safari and every browser you know as of today, supports Javascript.
- Javascript helps you create really beautiful and crazy fast websites. You can develop your website with a console like look and feel and give your users the best Graphical User Experience.
- JavaScript usage has now extended to mobile app development, desktop app development, and game development. This opens many opportunities for you as Javascript Programmer.
- Due to high demand, there is tons of job growth and high pay for those who know JavaScript. You can navigate over to different job sites to see what having JavaScript skills looks like in the job market.
- Great thing about Javascript is that you will find tons of frameworks and Libraries already developed which can be used directly in your software development to reduce your time to market.

Applications of Javascript Programming

As mentioned before, **Javascript** is one of the most widely used **programming languages** (Front-end as well as Back-end). It has it's presence in almost every area of software development. I'm going to list few of them here:

- **Client side validation** - This is really important to verify any user input before submitting it to the server and Javascript plays an important role in validting those inputs at front-end itself.
- **Manipulating HTML Pages** - Javascript helps in manipulating HTML page on the fly. This helps in adding and deleting any HTML tag very easily using javascript and modify your HTML to change its look and feel based on different devices and requirements.
- **User Notifications** - You can use Javascript to raise dynamic pop-ups on the webpages to give different types of notifications to your website visitors.
- **Back-end Data Loading** - Javascript provides Ajax library which helps in loading back-end data while you are doing some other processing. This really gives an amazing experience to your website visitors.
- **Presentations** - JavaScript also provides the facility of creating presentations which gives website look and feel. JavaScript provides RevealJS and BespokeJS libraries to build a web-based slide presentations.
- **Server Applications** - Node JS is built on Chrome's Javascript runtime for building fast and scalable network applications. This is an event based library which helps in developing very sophisticated server applications including Web Servers.

Example:- Hello World using Javascript

```
<html>
  <body>
    <script language = "javascript" type = "text/javascript">
      <!--
        document.write("Hello World!")
      //-->
    </script>
  </body>
</html>
```

Advantages of JavaScript

The merits of using JavaScript are −

- **Less server interaction** − You can validate user input before sending the page off to the server. This saves server traffic, which means less load on your server.
- **Immediate feedback to the visitors** − They don't have to wait for a page reload to see if they have forgotten to enter something.
- **Increased interactivity** − You can create interfaces that react when the user hovers over them with a mouse or activates them via the keyboard.
- **Richer interfaces** − You can use JavaScript to include such items as drag-and-drop components and sliders to give a Rich Interface to your site visitors.

Limitations of JavaScript

We cannot treat JavaScript as a full-fledged programming language. It lacks the following important features −

- Client-side JavaScript does not allow the reading or writing of files. This has been kept for security reason.
- JavaScript cannot be used for networking applications because there is no such support available.
- JavaScript doesn't have any multi-threading or multiprocessor capabilities.

Once again, JavaScript is a lightweight, interpreted programming language that allows you to build interactivity into otherwise static HTML pages.

JavaScript Development Tools

One of major strengths of JavaScript is that it does not require expensive development tools. You can start with a simple text editor such as Notepad. Since it is an interpreted language inside the context of a web browser, you don't even need to buy a compiler.

To make our life simpler, various vendors have come up with very nice JavaScript editing tools. Some of them are listed here −

- **Microsoft FrontPage** − Microsoft has developed a popular HTML editor called FrontPage. FrontPage also provides web developers with a number of JavaScript tools to assist in the creation of interactive websites.
- **Macromedia Dreamweaver MX** − Macromedia Dreamweaver MX is a very popular HTML and JavaScript editor in the professional web development crowd. It provides several handy prebuilt JavaScript components, integrates well with databases, and conforms to new standards such as XHTML and XML.

- **Macromedia HomeSite 5** − HomeSite 5 is a well-liked HTML and JavaScript editor from Macromedia that can be used to manage personal websites effectively.

Features of JavaScript

- JavaScript is a client side technology, it is mainly used for gives client side validation. JavaScript is a object-based scripting language.
- Giving the user more control over the browser.
- It Handling dates and time.
- It detecting the user's browser and OS.
- It is light weighted.
- JavaScript is a scripting language and it is not java.
- JavaScript is interpreter based scripting language.
- JavaScript is case sensitive.
- JavaScript is object based language as it provides predefined objects.
- Every statement in JavaScript must be terminated with semicolon (;).
- Most of the JavaScript control statements syntax is same as syntax of control statements in C language.

Bootstrap

Bootstrap is a free and open-source tool collection for creating responsive websites and web applications. It is the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first websites. It solves many

problems which we had once, one of which is the cross-browser compatibility issue. Nowadays, the websites are perfect for all the browsers (IE, Firefox, and Chrome) and for all sizes of screens (Desktop, Tablets, Phablets, and Phones). A bootstrap is the program that initializes the operating system (OS) during startup. The term bootstrap or bootstrapping originated in the early 1950s. It referred to a bootstrap load button that was used to initiate a hardwired bootstrap program, or smaller program that executed a larger program such as the OS. The term was said to be derived from the expression "pulling yourself up by your own bootstraps," starting small and loading programs one at a time while each program is "laced" or connected to the next program to be executed in sequence.

Bootstrapping is the process of loading a set of instructions when a computer is first turned on or booted. During the startup process, diagnostic tests are performed, such as the power-on self-test (POST) that set or check configurations for devices and implement routine testing for the connection of peripherals, hardware and external memory devices. The bootloader or bootstrap program is then loaded to initialize the OS.

Why Bootstrap?

- ✓ Faster and Easier Web Development.
- ✓ It creates Platform-independent web pages.
- ✓ It creates Responsive Web-pages.
- ✓ It is designed to be responsive to mobile devices too.

Advantages of Using Bootstrap

If you have had some experience with any front-end framework, you might be wondering what makes Bootstrap so special. Here are some advantages why one should opt for Bootstrap framework:

- **Save lots of time** — You can save lots of time and efforts using the Bootstrap predefined design templates and classes and concentrate on other development work.
- **Responsive features** — Using Bootstrap you can easily create responsive websites that appear more appropriately on different devices and screen resolutions without any change in markup.
- **Consistent design** — All Bootstrap components share the same design templates and styles through a central library, so the design and layout of your web pages will be consistent.
- **Easy to use** — Bootstrap is very easy to use. Anybody with the basic working knowledge of HTML, CSS and JavaScript can start development with Bootstrap.
- **Compatible with browsers** — Bootstrap is created with modern web browsers in mind and it is compatible with all modern browsers such as Chrome, Firefox, Safari, Internet Explorer, etc.

What is Responsive Web Design

- Responsive web design is a process of designing and building websites to provide better accessibility and optimal viewing experience to the user by optimizing it for different devices.
- With the growing trend of smart phones and tablets, it has become almost unavoidable to ignore the optimization of sites for mobile devices. Responsive

web design is a preferable alternative and an efficient way to target a wide range of devices with much less efforts.

- Responsive layouts automatically adjust and adapts to any device screen size, whether it is a desktop, a laptop, a tablet, or a mobile phone. See the following Illustration.

Creating Responsive Layout with Bootstrap

- With the Bootstrap powerful mobile first flexbox grid system creating the responsive and mobile friendly websites and applications has become much easier.

- Bootstrap is responsive and mobile friendly from the start. Its six tier grid classes provides better control over the layout as well as how it will be rendered on different types of devices like mobile phones, tablets, laptops and desktops, large screen devices, and so on.

Angular(Web framework)

Angular is a TypeScript-based free and open-source web application framework led by the Angular Team at Google and by a community of individuals and corporations. Angular is a complete rewrite from the same team that built AngularJS.

The architecture of an Angular application relies on certain fundamental concepts. The basic building blocks of the Angular framework are Angular components that are organized into ***Ng Modules***. Ng Modules collect related code into functional sets; an Angular application is defined by a set of Ng Modules. An application always has at leasta ***root module*** that enables bootstrapping, and typically has many more ***feature modules***.

- A component class that handles data and functionality.
- An HTML template that determines the UI.
- Component-specific styles that define the look and feel.

AngularJS Expressions

- AngularJS expressions can be written inside double braces: {{ *expression* }}.
- AngularJS expressions can also be written inside a directive: ng-bind="*expression*".
- AngularJS will resolve the expression, and return the result exactly where the expression is written.
- **AngularJS expressions** are much like **JavaScript expressions:** They can contain literals, operators, and variables.
- Example {{ 5 + 5 }} or {{ firstName + " " + lastName }}

What is Angular 7?

Angular 7 is a JavaScript **(actually a TypeScript based open-source full-stack web application)** framework which makes you able to create reactive **Single Page Applications** (SPAs). Angular 7 is completely based on components. It consists of several components which forms a tree structure with parent and child components. Angular's versions beyond 2+ are generally known as **Angular** only. The very first version Angular 1.0 is known as **AngularJS.**

"Angular is a complete rewrite of AngularJS by the same team that built AngularJS."

What is Single Page Application (SPA)?

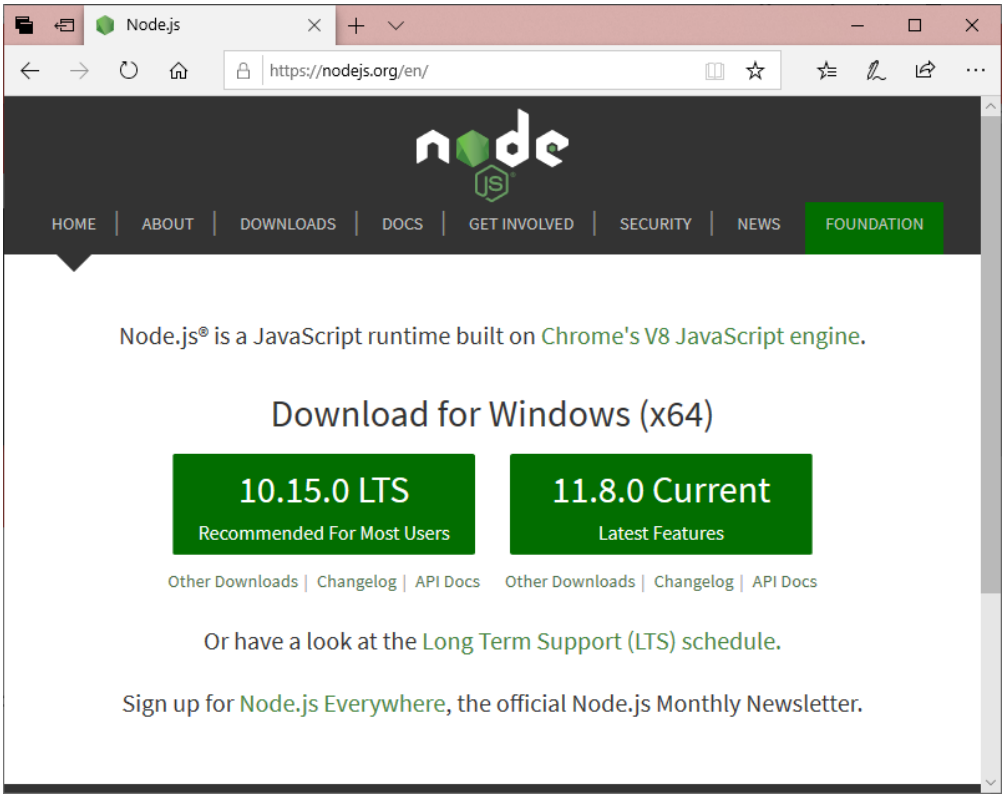
A single page application is a web application or a website which provides users a very fluid, reactive and fast experience similar to a desktop application. It contains menu, buttons and blocks on a single page and when a user clicks on any of them; it dynamically rewrites the current page rather than loading entire new pages from a server. That's the reason behind its reactive fast speed.

How to install Angular 7?

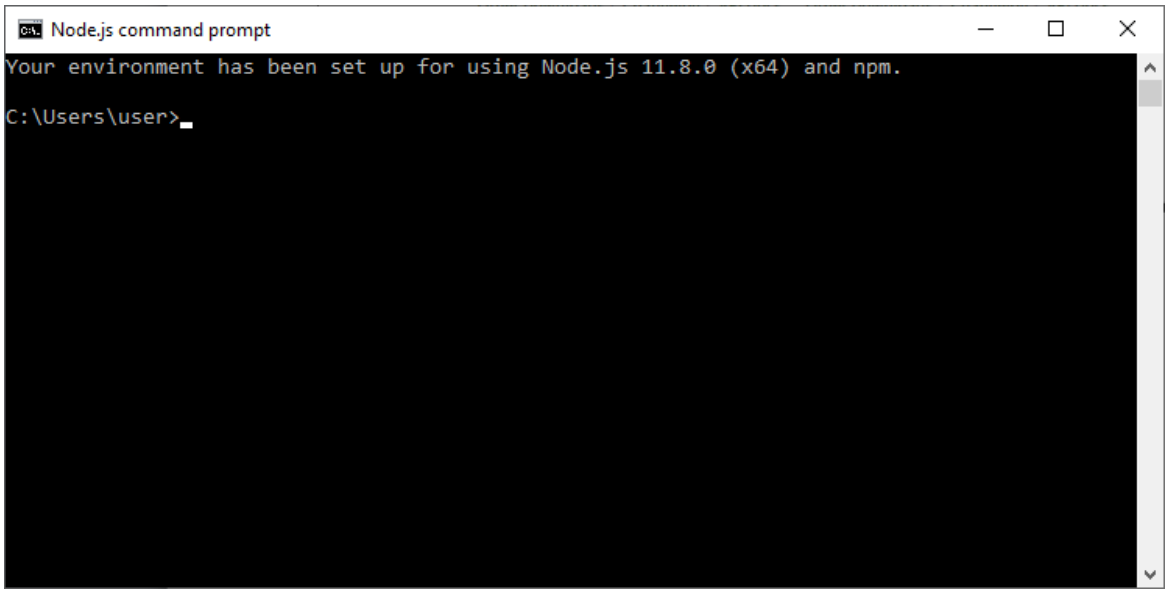
Install Visual Studio Code IDE or JetBrains WebStorm

- You must have an IDE like Visual Studio Code IDE or JetBrains WebStorm to run your Angular 7 app.
- VS Code is light and easy to setup, it has a great range of built-in code editing, formatting, and refactoring features. It is free to use. It also provides a huge number of extensions that will significantly increase your productivity.
- You can download VS Code from here: **https://code.visualstudio.com**
- JetBrains WebStorm is also a great IDE to develop Angular 7 apps. It is fast, attractive, and very easy to use software but, it is not free to use. You have to purchase it later, it only provides a trial period of 30 days for free.

- You can download VS Code from here: **https://www.jetbrains.com/webstorm/download/#section=windows**



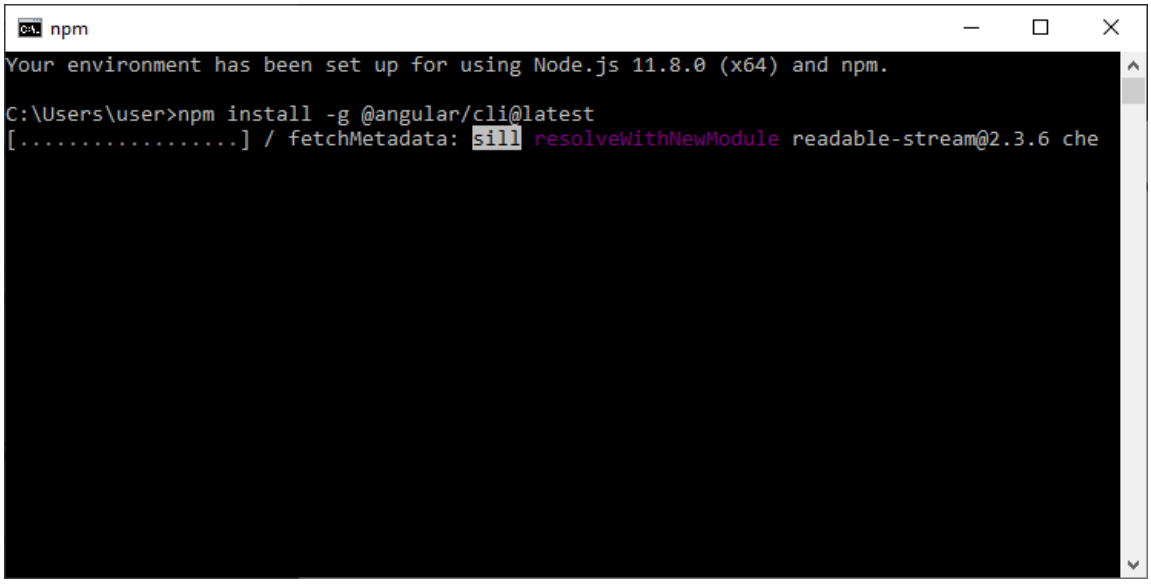
After the successful installation, you will see command prompt like this:



Use npm to install Angular CLI

Run the Angular CLI command to install Angular CLI

npm install -g @angular/cli



Node.js

Node.js tutorial provides basic and advanced concepts of Node.js. Our Node.js tutorial is designed for beginners and professionals both.

Node.js is a cross-platform environment and library for running JavaScript applications which is used to create networking and server-side applications.

Our Node.js tutorial includes all topics of Node.js such as Node.js installation on windows and linux, REPL, package manager, callbacks, event loop, os, path, query string, cryptography, debugger, URL, DNS, Net, UDP, process, child processes, buffers, streams, file systems, global objects, web modules etc. There are also given Node.js interview questions to help you better understand the Node.js technology.

What is Node.js

Node.js is a cross-platform runtime environment and library for running JavaScript applications outside the browser. It is used for creating server-side and networking web applications. It is open source and free to use. It can be downloaded from this link https://nodejs.org/en/

Many of the basic modules of Node.js are written in JavaScript. Node.js is mostly used to run real-time server applications.

The definition given by its official documentation is as follows:

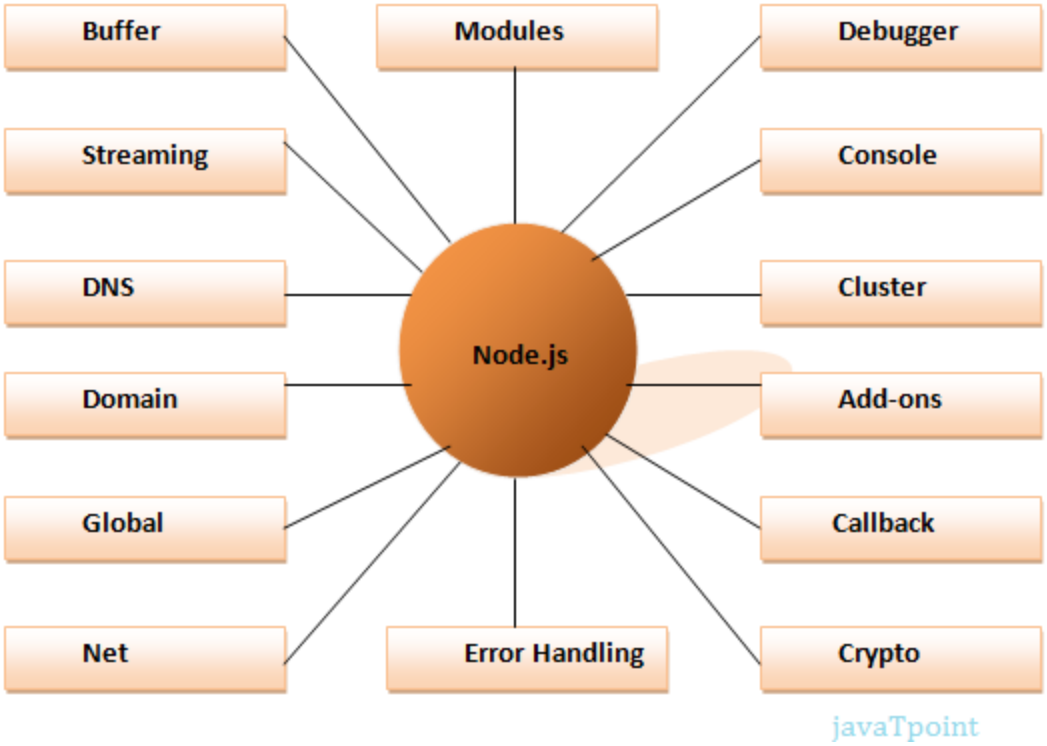
?Node.js is a platform built on Chrome's JavaScript runtime for easily building fast and scalable network applications. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient, perfect for data-intensive real-time applications that run across distributed devices.?

Node.js also provides a rich library of various JavaScript modules to simplify the development of web applications.

1. Node.js = Runtime Environment + JavaScript Library

Different parts of Node.js

The following diagram specifies some important parts of Node.js:



Features of Node.js

.

1. **Extremely fast:** Node.js is built on Google Chrome's V8 JavaScript Engine, so its library is very fast in code execution.
2. **I/O is Asynchronous and Event Driven:** All APIs of Node.js library are asynchronous i.e. non-blocking. So a Node.js based server never waits for an API to return data. The server moves to the next API after calling it and a notification mechanism of Events of Node.js helps the server to get a response from the previous API call. It is also a reason that it is very fast.
3. **Single threaded:** Node.js follows a single threaded model with event looping.
4. **Highly Scalable:** Node.js is highly scalable because event mechanism helps the server to respond in a non-blocking way.

5. **No buffering:** Node.js cuts down the overall processing time while uploading audio and video files. Node.js applications never buffer any data. These applications simply output the data in chunks.
6. **Open source:** Node.js has an open source community which has produced many excellent modules to add additional capabilities to Node.js applications.
7. **License:** Node.js is released under the MIT license.

Node.js web-based Example

1. **Import required modules:** The "require" directive is used to load a Node.js module.
2. **Create server:** You have to establish a server which will listen to client's request similar to Apache HTTP Server.
3. **Read request and return response:** Server created in the second step will read HTTP request made by client which can be a browser or console and return the response.

Key Features of Node.js

- **Asynchronous and Event-Driven:** The Node.js library's APIs are all asynchronous (non-blocking) in nature. A server built with Node.JS never waits for data from an API. from an API. After accessing an API, the server moves on to the next one. In order to receive and track responses of previous API requests, it uses a notification mechanism called Events.
- **Single-Threaded:** Node.js employs a single-threaded architecture with event looping, making it very scalable. In contrast to typical servers, which create limited threads to process requests, the event mechanism allows the node.js server to reply in a non-blocking manner and makes it more scalable. When compared to traditional servers like Apache HTTP Server, Node.js uses a single-threaded program that can handle a considerably larger number of requests.

- **Scalable:** NodeJs addresses one of the most pressing concerns in software development: scalability. Nowadays, most organizations demand scalable software. NodeJs can also handle concurrent requests efficiently. It has a cluster module that manages load balancing for all CPU cores that are active. The capability of NodeJs to partition applications horizontally is its most appealing feature. It achieves this through the use of child processes. This allows the organizations to provide distinct app versions to different target audiences, allowing them to cater to client preferences for customization.
- **Quick execution of code:** Node.js makes use of the V8 JavaScript Runtime motor, which is also used by Google Chrome. Hub provides a wrapper for the JavaScript motor, which makes the runtime motor faster. As a result, the preparation of requests inside Node.js becomes faster as well.
- **Cross-platform compatibility:** NodeJS may be used on a variety of systems, including Windows, Unix, Linux, Mac OS X, and mobile devices. It can be paired with the appropriate package to generate a self-sufficient executable.
- **Uses JavaScript:** JavaScript is used by the Node.js library, which is another important aspect of Node.js from the engineer's perspective. Most of the engineers are already familiar with JavaScript. As a result, a designer who is familiar with JavaScript will find that working with Node.js is much easier.
- **Fast data streaming:** When data is transmitted in multiple streams, processing them takes a long time. Node.js processes data at a very fast rate. It processes and uploads a file simultaneously, thereby saving a lot of time. As a result, NodeJs improves the overall speed of data and video streaming.
- **No Buffering:** In a Node.js application, data is never buffered.

Disadvantages of Node.js

- API is not stable and keeps changing for NodeJs.

- Code for large applications is complex due to the asynchronous nature of NodeJs.
- Does not have a strong library support system

What Can Node.js Do?

- Node.js can generate dynamic page content
- Node.js can create, open, read, write, delete, and close files on the server
- Node.js can collect form data
- Node.js can add, delete, modify data in your database

What is a Node.js File?

- Node.js files contain tasks that will be executed on certain events
- A typical event is someone trying to access a port on the server
- Node.js files must be initiated on the server before having any effect
- Node.js files have extension ".js"
- Node.js is an open source server environment
- Node.js is free
- Node.js runs on various platforms (Windows, Linux, Unix, Mac OS X, etc.)
- Node.js uses JavaScript on the server

MongoDB

What is MongoDB?

Mongo DB is a document-oriented No SQL database used for high volume data storage. Instead of using tables and rows as in the traditional relational databases, Mongo DB makes use of collections and documents. Documents consist of key-value pairs which are the basic unit of data in Mongo DB. Collections contain sets of documents and function which is the equivalent of relational database tables. Mongo DB is a database which came into light around the mid-2000s.

Mongo DB Features

Each database contains collections which in turn contains documents. Each document can be different with a varying number of fields. The size and content of each document can be different from each other.

- The document structure is more in line with how developers construct their classes and objects in their respective programming languages. Developers will often say that their classes are not rows and columns but have a clear structure with key-value pairs.
- The a row (or documents as called in MongoDB) doesn't need to have a schema defined beforehand. Instead, the fields can be created on the fly.
- The data model available within MongoDB allows you to represent hierarchical relationships, to store arrays, and other more complex structures more easily
- Scalability – The MongoDB environments are very scalable. Companies across the world have defined clusters with some of them running 100+ nodes with around millions of documents within the database

Database

- Database is a physical container for collections. Each database gets its own set of files on the file system. A single MongoDB server typically has multiple databases.

Collection

- Collection is a group of MongoDB documents. It is the equivalent of an RDBMS table. A collection exists within a single database. Collections do not enforce a schema. Documents within a collection can have different fields. Typically, all documents in a collection are of similar or related purpose.

Document

- A document is a set of key-value pairs. Documents have dynamic schema. Dynamic schema means that documents in the same collection do not need to have the same set of fields or structure, and common fields in a collection's documents may hold different types of data.

Advantages of MongoDB over RDBMS

- **Schema less** − MongoDB is a document database in which one collection holds different documents. Number of fields, content and size of the document can differ from one document to another.
- Structure of a single object is clear.
- No complex joins.
- Deep query-ability. MongoDB supports dynamic queries on documents using a document-based query language that's nearly as powerful as SQL.
- Tuning.
- **Ease of scale-out** − MongoDB is easy to scale.
- Conversion/mapping of application objects to database objects not needed.

- Uses internal memory for storing the (windowed) working set, enabling faster access of data.

Why Use MongoDB?

- **Document Oriented Storage** − Data is stored in the form of JSON style documents.
- Index on any attribute
- Replication and high availability
- Auto-Sharding
- Rich queries
- Fast in-place updates
- Professional support by MongoDB

Where to Use MongoDB?

- Big Data
- Content Management and Delivery
- Mobile and Social Infrastructure
- User Data Management
- Data Hub

What is Express Server

Express is a small framework that sits on top of Node.js's web server functionality to simplify its APIs and add helpful new features. It makes it easier to organize your application's functionality with middle ware and routing; it adds helpful utilities to Node.js's HTTP objects; it facilitates the rendering of dynamic HTTP objects.

Express is a part of **MEAN** stack, a full stack JavaScript solution used in building fast, robust, and maintainable production web applications.

MongoDB(Database)
ExpressJS(Web Framework)
AngularJS(Front-end Framework)
NodeJS(Application Server)

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
- The above command saves the installation locally in the **node_modules** directory and creates a directory express inside node_modules. You should install the following important modules along with express −
- **body-parser** − This is a node.js middleware for handling JSON, Raw, Text and URL encoded form data.
- **cookie-parser** − Parse Cookie header and populate req.cookies with an object keyed by the cookie names.
- **multer** − This is a node.js middleware for handling multipart/form-data.

ABOUT IDE USED

The IDE (Integrated Development Environment) that we have used in our project is Visual Studio Code. VS Code is an IDE that is developed by Microsoft and allows you to create code you can write code in any language. It is the most used IDE nowadays. It has a user-friendly UI and also easy to integrate any language like python, C++ etc. It has a lot of extensions supported which is very helpful in programming

Language support: Out-of-the-box, Visual Studio Code includes basic support for most common programming languages. This basic support includes syntax highlighting, bracket matching, code folding, and configurable snippets. Visual Studio Code also ships with IntelliSense for JavaScript, Typescript, JSON, CSS, and HTML, as well as debugging support for Node.js. Support for additional languages can be provided by freely available extensions on the VS Code Marketplace.

Data collection: Visual Studio Code collects usage data and sends it to Microsoft, although this can be disabled. In addition, because of the open-source nature of the application, the telemetry code is accessible to the public, who can see exactly what is collected.

Version control: Source control is a built-in feature of Visual Studio Code. It has a dedicatedtab inside of the menu bar where you can access version control settings and view changes made to the current project. To use the feature, you must link Visual Studio Code to any supported version control system (Git, Apache Subversion, Perforce, etc.).

What can Visual Studio Code do?

Visual Studio Code has some very unique features. They are listed as below :

- **Support for multiple programming languages:** Supports multiple programming languages. So earlier, programmers needed Web-Support: a different editor for different languages, but it has built-in multi-language support.
- **Intelli-Sense:** It can detect if any snippet of code is left incomplete. Also, common variable syntaxes and variable declarations are made automatically. Ex: If a certain variable is being used in the program and the user has forgotten to declare, intelli-sense will declare it for the user.

- **Cross-Platform Support:** Traditionally, editors used to support either Windows or Linux or Mac Systems. But Visual Studio Code is cross-platform. So it can work on all three platforms. Also, the code works on all three platforms; else, the open-source and proprietary software codes used to be different.

- **Extensions and Support:** Usually supports all the programming languages but, if the user/programmer wants to use the programming language which is not supported then, he can download the extension and use it. And performance-wise, the extension doesn't slow down the editor as it rums as a different process.

- **Repository:** With the ever-increasing demand for the code, secure and timely storage is equally important. It is connected with Git or can be connected with any other repository for pulling or saving the instances.

- **Web-Support:** Comes with built-in support for Web applications. So web applications can be built and supported in VSC.

- **Hierarchy Structure:** The code files are located in files and folders. The required code files also have some files, which may be required for other complex projects. These files can be deleted as per convenience.

- **Improving Code:** Some code snippets can be declared a bit differently, which might help the user in the code. This function prompts the user, wherever necessary, to change it to the suggested option.

- **Terminal Support:** Many of the times, the user needs to start from the root of the directory to start with a particular action, in-built terminal or console provides user support to not to switch in-between two screens for the same.

- **Multi-Projects:** Multiple projects containing multiple files/folders can be opened simultaneously. These projects/folders might or might not be related to each other.

- **Git Support:** Resources can be pulled from Git Hub Repo online and vice-versa; saving can be done too. Resource pulling also means cloning the code which is made available on the internet. This code can later be changed and saved.

- **Commenting:** A common feature, but some of the languages do not support it. Commenting on the code helps the user to recall or track according to the sequence he wants.

CHAPTER: 2 LITERATURE SURVEY

2.1 EXISTING AND PURPOSED SYSTEM

- The “ Website" has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardshipsfaced by this existing system. Gym Management System allows the user to store the medicine details, employee details,the details of person who is in the gym, gym equipment details etc .This software package allows storing the details of all the data related to gymnasium The system is strong enough to withstand regressive yearly operations under conditions where the database is maintained and cleared over a certain time of span. The implementation of the system in the organization will considerably reduce data entry, time and also provide readily calculated reports.

    - Required a lot of paperwork
    - Lack of storage space for handwritten documents.
    - Information is not available globally
    - Existing system was manual
    - Time consuming

2.3 Feasibility Analysis

The next step in analysis is to verify the feasibility of the proposed system. "All projects are feasible given unlimited resources and infinite time ". But in reality both resources and time are scarce. Projects should conform to time bounds and should be optimal in three consumption of resources. This places a constant on approval any project.

Purpose

The feasibility analysis is designed to determine whether or not, given the project environment, a project will be successful (in virtually any interpretation of that word). A feasibility analysis may be conducted for a project with an emphasis on financial viability, environmental integrity, cultural acceptability, or political practicability. It is a determination as to the likelihood of success and a description of how that determination was achieved.

Application

Feasibility analyses are used to present an approach or a series of alternatives and to offer decision-making guidance based on the climate in which the project will evolve. They often defend a single or primary approach, incorporating extensive forecasts on the project's development, as well as its evolution after implementation. Because a feasibility analysis may focus on one or many aspects of a project, it may be a very short (one- to two-page) or long (multivolume) document. In any case, it generally begins with an executive summary and a description of the project outputs in their as-built condition.

Feasibility Study Areas

Feasibility as applied to our system pertains to the following areas:

- Technical feasibility
- Operational feasibility
- Economic feasibility
- Social feasibility
- Management feasibility
- Legal feasibility

Technical Feasibility:

Technical feasibility centers on the existing computer systems (hardware, software)

to what extent it can support the proposed addition. For example, if the current computer is operating at 80 percent capacity then running another application could overload the system or require additional hardware. This involves financial considerations to accommodate technical enhancements. If budget is a serious constraint, then the project is judged not feasible.

In examining technical feasibility, configuration of the system is given more importance than the actual make of hardware. The configuration should give the complete picture about the system requirements. What speeds of input and output should be achieved at particular quality of printing.

The team for developing Resource Tracker System is equipped with all the modern facilities and the latest software. Therefore as far as the equipment and the software was concerned there was no problem. Moreover the technical skills required to complete the

project were also present in the form of competent software professionals. Thus the project was considered technically feasible.

Economic Feasibility:

Economic analysis is the most frequently used technique for evaluating the effectiveness of a proposed system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and saving that are expected from a proposed system and compare them with cost. If benefits outweigh cost, a decision is taken to design and implement the system. Otherwise, further justification or alternative in the proposed system will have to be made if it is to have a chance of being approved. This is an ongoing effort that improves in accuracy at each phase of the system life cycle.

The costs include development costs, equipment costs, personal costs like team members salaries, operating costs like power used etc. Since, the benefits and savings overweigh costs, a decision is made to design and implement the system.

Operation Feasibility:

It is mainly related to human organizational aspects. The points to be considered are:

What changes will be brought with the system?

What organization structures are disturbed?

What new skills will be required?

Do the existing staff members have these skills? If not, can they be trained in due course of time?

Proposed system is beneficial only if they can be turned into information system that will meet the organization operating requirements and efficiency. As the system is user friendly for those who have to maintain the records of work done on each project by various resources and also to resources that have to make their day to day time entries. If the user wants more facilities that can also be provided

Steps in Feasibility analysis:

1. Form a project team and appoint a project leader.

2. Prepare system flowcharts.

3. Enumerate potential candidate systems.

4. Describe and identify characteristics of candidate systems.

5. Determine and evaluate performance and cost effectiveness of each candidate system.

6. Weight system performance and cost data.

7. Select the best candidate system.

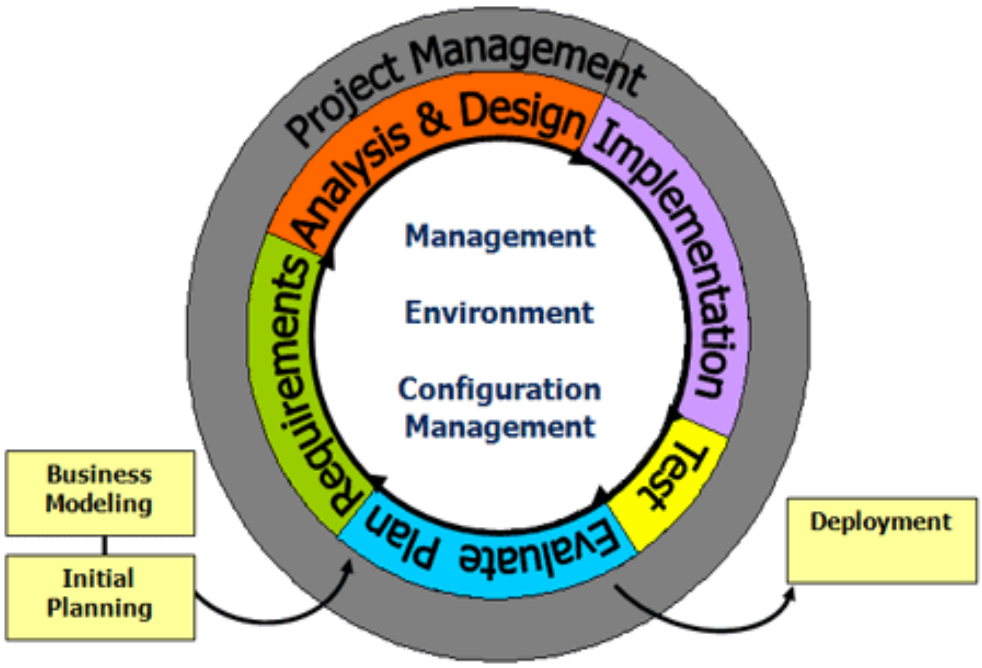
8. Prepare and report final project directive to management.

CHAPTER: 3 SYSTEM ANALYSIS & DESIGN

3.1 SYSTEM REQUIREMENT SPECIFICATIONS

A software requirements specification (SRS) is a comprehensive description of the intended purpose and environment for software under development. The SRS fully describes what the software will do and how it will be expected to perform.

An SRS minimizes the time and effort required by developers to achieve desired goals and also minimizes the development cost. A good SRS defines how an application will interact with system hardware, other programs and human users in a wide variety of real-world situations. Parameters such as operating speed, response time, availability, portability, maintainability, footprint, security and speed of recovery from adverse events are evaluated. Methods of defining an SRS are described by the IEEE (Institute of Electrical and Electronics Engineers) specification 830-1998.



Need for SRS:

A basic purpose of software requirements specification is to bridge the communication gap between the user & system analyst, SRS is the medium through which the client and user needs are accurately specified; indeed SRS forms the basis of software development. A good SRS should satisfy all the parties- sometimes very hard to achieve and involves trade off and persuasion. Another important purpose of developing an SRS is helping the clients to understand their own needs.

A main purpose of the product specification is to define the need of the product's user. Sometimes, the specification may be a part of a contract sign between the producer and the user. It could also form part of the user manuals. A user's needs are sometimes not clearly understood by the developer. If this is the case, a careful analysis – involving much interaction with the user should be devoted to reaching a clear statement of requirements, in order to avoid possible misunderstandings. Sometimes, at the beginning of a project, even the user has no clear idea of what exactly the desired product is. Think for instance of user interface , a user with no previous experience with computer products may not appreciate the difference between , say menu driven interaction and a command line interface. Even an exact formation of system functions and performance may be missing an initial description produced by an experienced user.

SYSTEM DESIGN

- The most creative and challenging phase of SDLC is system design. The term design describes a final system and the process by which it is developed. It includes construction of programs and program testing.
- The purpose of the design phase is to plan a solution of the problem specified by the requirements document. This phase is the first step in moving from the problem domain to the solution domain. Starting with what is needed; design takes us towards how to satisfy the needs. The design of the system is perhaps the most critical factor affecting the quality of the software. It has a major impact on the later phase, particularly testing and maintenance. The output of this phase is the design document. This document is similar to the blueprint or plan for the solution and is used later during implementation, testing and maintenance.
- A systematic method has to achieve the beneficial result at the end. It includes starting with an average idea and developing it into a series of steps. The series of steps for successful system development are given below:

➢ Study the problem completely because first of all we should know the goal, which he has to achieve.
➢ We should see what kind of output we require and what kind of input we give so we can get the desired output from the system. It is a very challenging step of system development.
➢ According to the output requirement of the system the strength of various databases should be designed.
➢ Next, we should know what kind of program we should develop, which will lead us to reach our final goal.
➢ Then we write this individual program, which later on joining will solve the problem.
➢ Then we test these programs and make necessary corrections in them to achieve the target of the program.
➢ At last combining all these problems in the forms of a bar in the menu of windows, this will complete the software package for general insurance.

The three main objectives which the designer has to bear in mind are:-

1. How fast the design will be does the users work given particular hardware resources.
2. The extent to which the design is secure against human errors and machine malfunctions.
3. The ease with which the design allows the system to be changed.

To meet these objectives analysts and programmers use a top-down and bottom-up design.

- **TOP – DOWN DESIGN**

  It is also known as system design, and aims to identify the modules that should be in a system. It starts with a large picture and moves to the details. The analyst and team members look at major functions that the system must provide and break these down into smaller and smaller activities.

- **BOTTOM – UP APPROACH**

  It is also known as detailed design. It starts with details and then moves to the big picture. This approach is appropriate when users have specific requirements for output.

3.2 Data Flow Diagrams

In the late 1970s **data-flow diagrams** (DFDs) were introduced and popularized for structured analysis and design (Gane and Sarson 1979). DFDs show the flow of data from external entities into the system, showed how the data moved from one process to another, as well as its logical storage.

There are only four symbols:

- Squares representing **external entities**, which are sources or destinations of data.
- Rounded rectangles representing **processes**, which take data as input, do something to it, and output it.
- Arrows representing the **data flows**, which can either, be electronic data or physical items.
- Open-ended rectangles representing **data stores**, including electronic stores such as databases or XML files and physical stores such as or filing cabinets or stacks of paper.

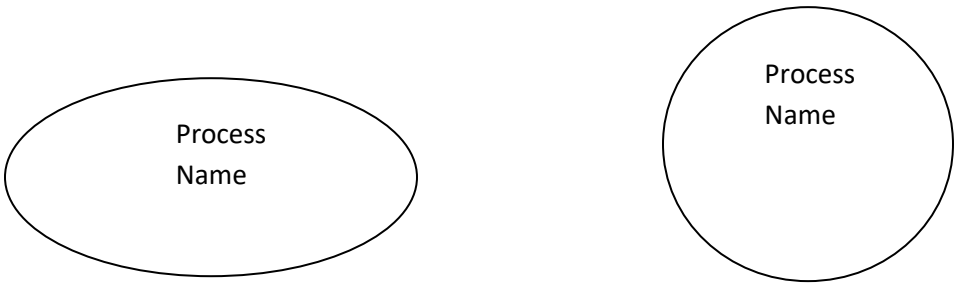
The dataflow diagram should contain following elements:

1. Processes
2. Data flow
3. Actors
4. Data-stores

In data flow diagram, processes that transfers the data, dataflow that move actor object that produce and consume data, and stores the data.

Process:

Processes are used to transform the data values. in the lowest level they work like pure function. The symbols of processes are:



(a)

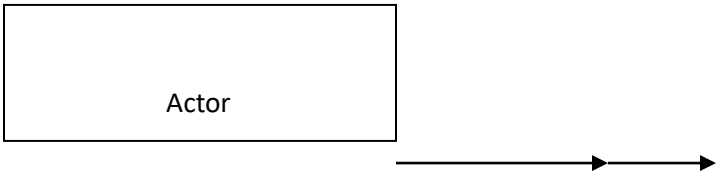
Data flow:

Dataflow is used for the connection. It connects the output of an object to the input for another object or processes. It represents as an intermediate data values within computations. The values are not changed by the data flow. The data flow is represented with the help of arrows as shown:

(b)

Actors (External entity):

An active object in the DFD which producing or receiving data flow with values is called actors. Input and output of dataflow are attached with actors. The actors are lie on the boundary of the data flow graph but terminate the flow data as sources and links of data, and so are sometimes called terminators. An actor can be described by a rectangle.

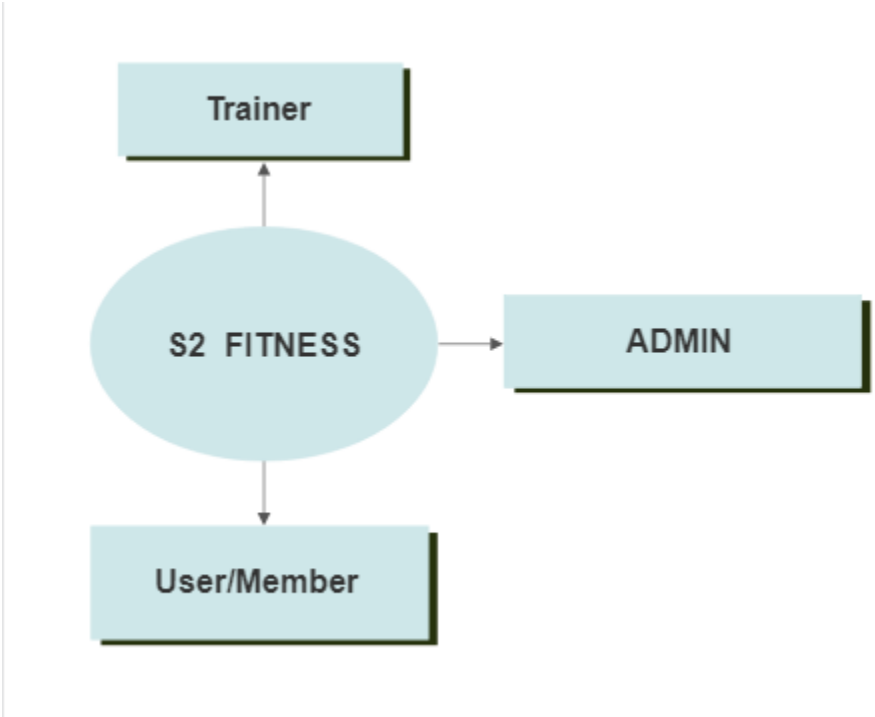


(c)

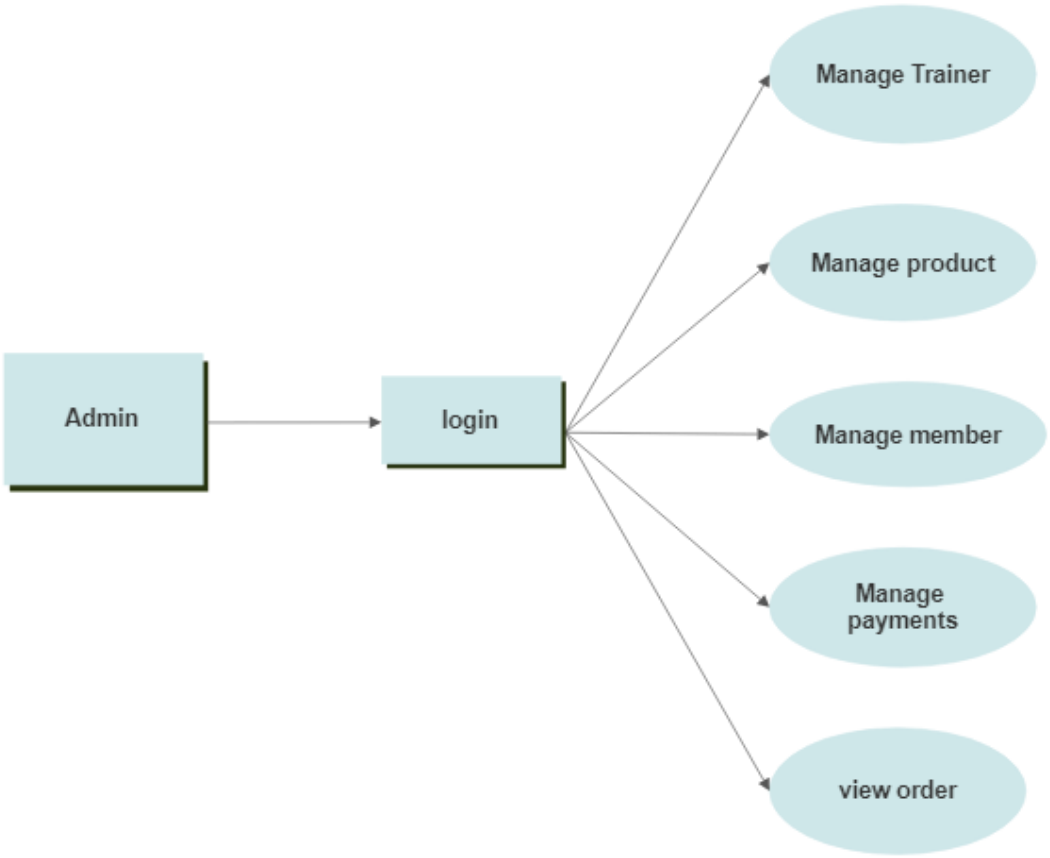
Data stores:

A data store indicates a passive object within a data flow diagram that stores data for later access. It doesn't manage by operation but produce any result or data access. A data stores allow value to be accessed in different order than they are generated.

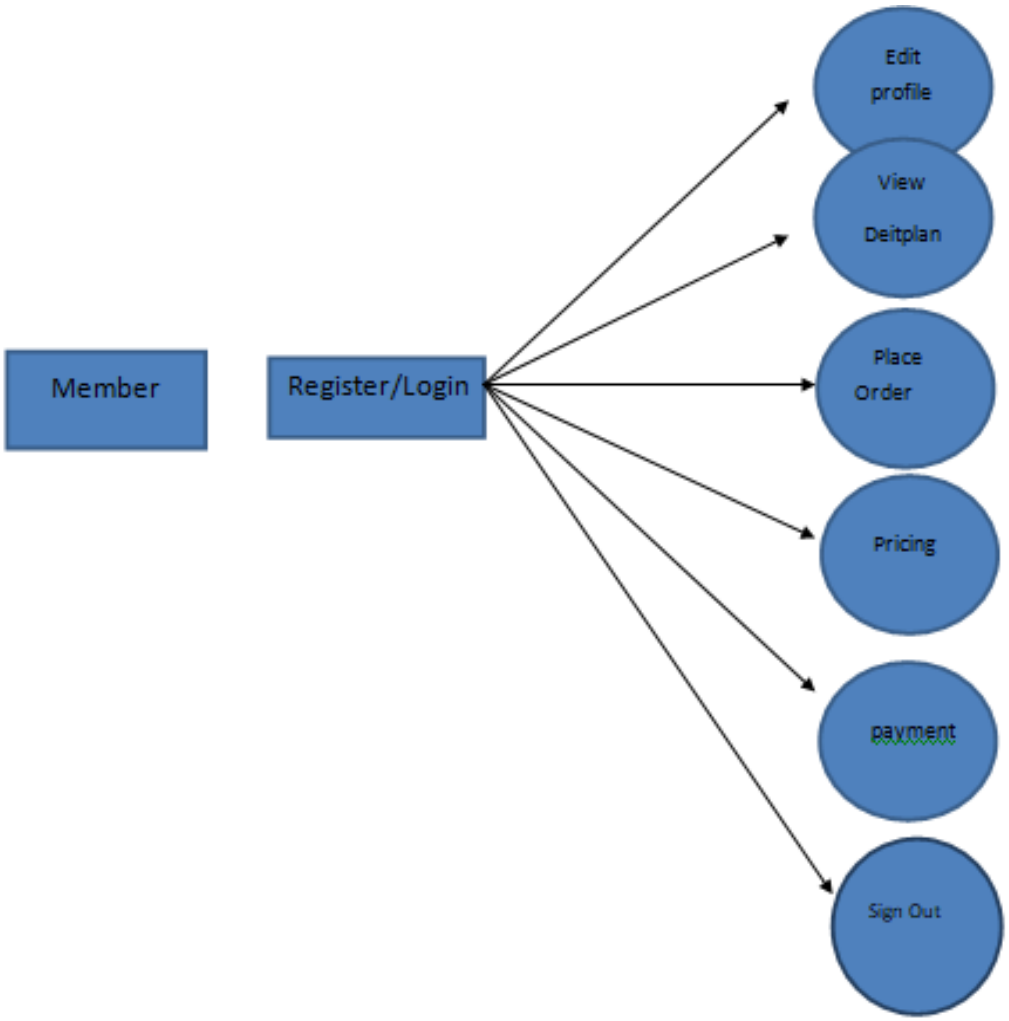
Level 0 DFD:



Level 1 DFD: For Admin



Level 1 DFD: For Member/user



3.3 Testing Process

The testing activities are done in all phases of the lifecycle in an iterative software development approach. However, the emphasis on testing activities varies in different phases. This procedure explains the focus of testing in inception, elaboration, construction and transition phases. In the inception phase most of requirements capturing is done and the test plan is developed. In elaboration phase most of design is developed, and test cases are developed. Construction phase mainly focuses on development of components and units, and unit testing is the focus in this phase. Transition phase is about deploying software in the user community and most of the system testing and acceptance testing is done in this phase.

Purpose

The main purposes of this procedure are:

- To carry out comprehensive testing of the system/product and its individual components in order to ensure that the developed system/product conforms to the user requirements/design.
- To verify the proper integration of all components of the software.
- To verify that all requirements have been correctly implemented.
- To identify and ensure defects are addressed prior to the deployment of the software.

Test Planning

Initial test plan addresses system test planning, and over the elaboration, construction and transition phases this plan is updated to cater other testing requirements of these phases, like, unit & integration testing. The test Plan must contain the following:

Scope of testing

Methodology to be used for testing

Types of tests to be carried out

Resource & system requirements

A tentative Test Schedule

Preparation of Test Cases

Test cases describe the details of every test for each feature of the module. The inputs for preparation of test cases are the software requirement specifications and/or Design document/model. System test cases are prepared in elaboration phase, and initial integration test cases are prepared which are refined and completed in construction phase. These test cases are reviewed as per Review Procedure as defined by the Project Manager and adequate review records are maintained. These reviews are done against requirements and Design to ensure adequacy and completeness.

The expected results are specified in test cases, against test to be carried out.

One of the test cases made for the Registration module is shown next.

Preparation of Acceptance Plan

An Acceptance Plan is prepared and handed over to the customer. However it is at the discretion of the Project Manager to decide when to prepare the Acceptance Plan but the Project Manager should ensure that it is at least prepared before the completion of construction phase. This Plan helps the customer in planning, scheduling and providing resources to carry out the customer acceptance testing. The acceptance testing is done during deployment.The Acceptance plan must consist of:

Unit Testing

Unit testing is done as per Testing Guidelines.

Integration Testing

The system integrator compiles and links the system in increments. Each increment needs to go through testing of the functionality that has been added, as well as all tests the previous builds went through (regression tests). Within an iteration, integration testing is executed several times until the whole system has been successfully integrated.

Testing is done as per the Test Plan for the project. A Testing Team who may be an independent team or may include members of the project team carries out the tests.

System Testing

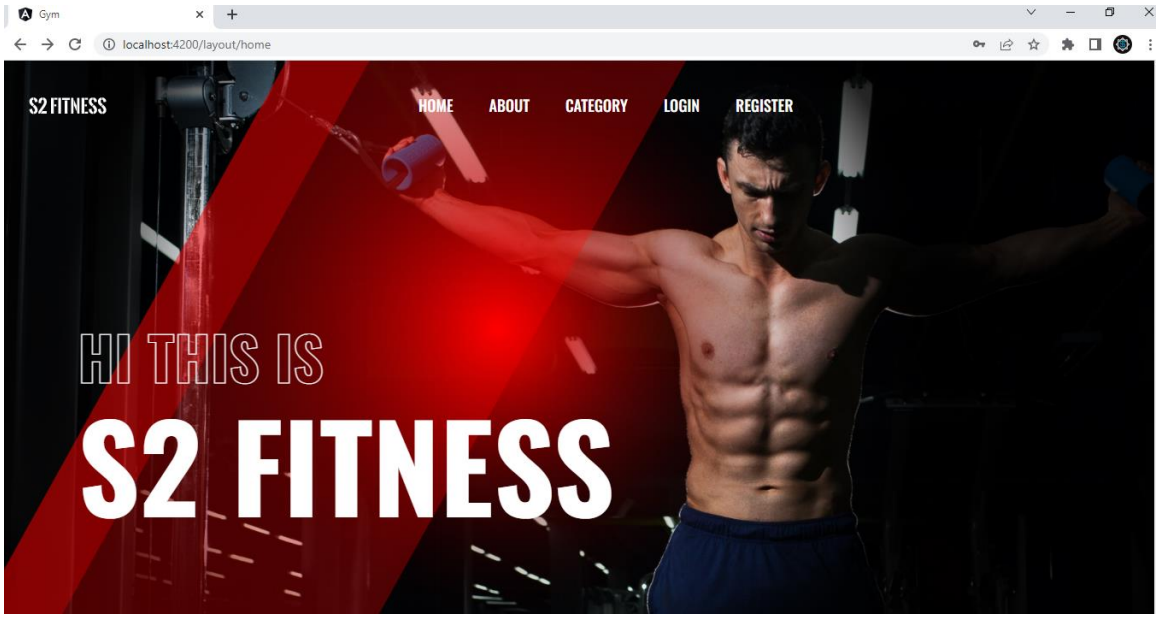
System testing is initiated through a System release and a Release Note from Development team to the testing team. The purpose of the System Testing is to ensure that the complete system functions are intended. The system roles in PMP compile and link the system in increments.

System Testing is similar to the Integration testing except that it is run under customer environment or in an environment as similar as to the customer environment, as possible. During the System testing the performance criteria is tested and factors like stress, transaction timing, volume of data, transaction frequency etc. are validated. The ability of the Software to be installed in an environment likely to be encountered at the site of the customer is also checked here.

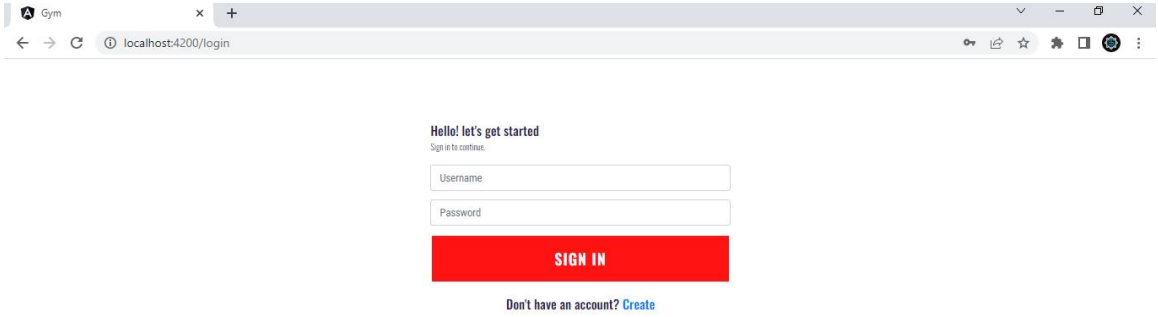
System testing of the software is performed against base lined software and the base lined documentation of the customer requirements and the software requirements specification documentation.

CHAPTER: 4 OUTPUTS

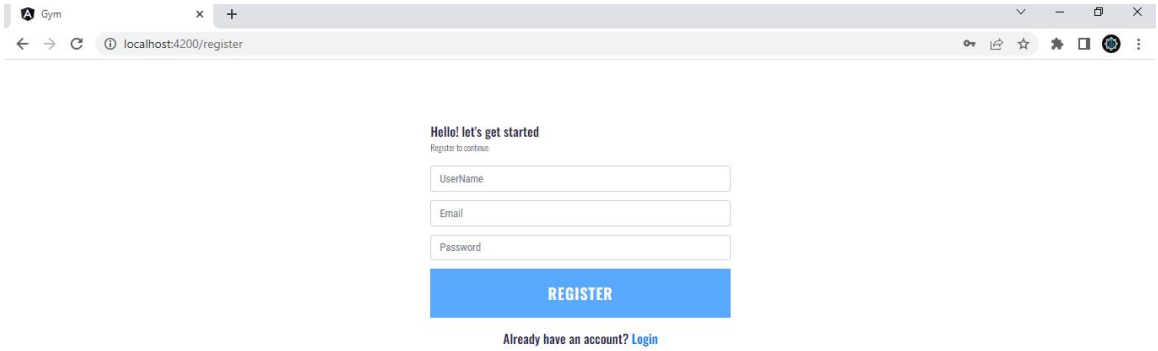
Home page



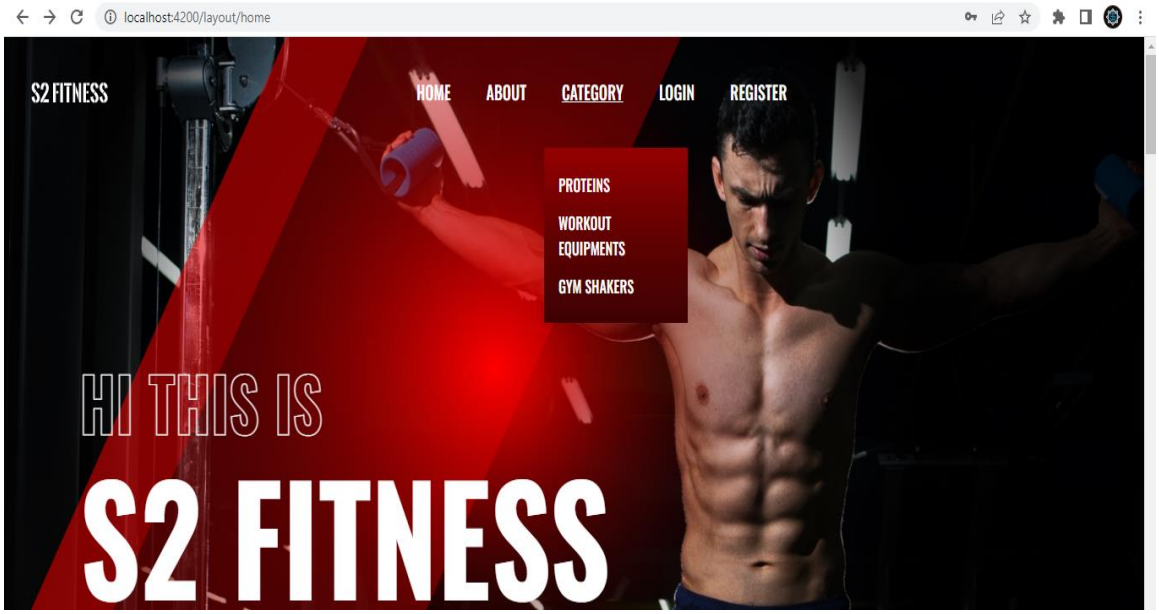
Login page



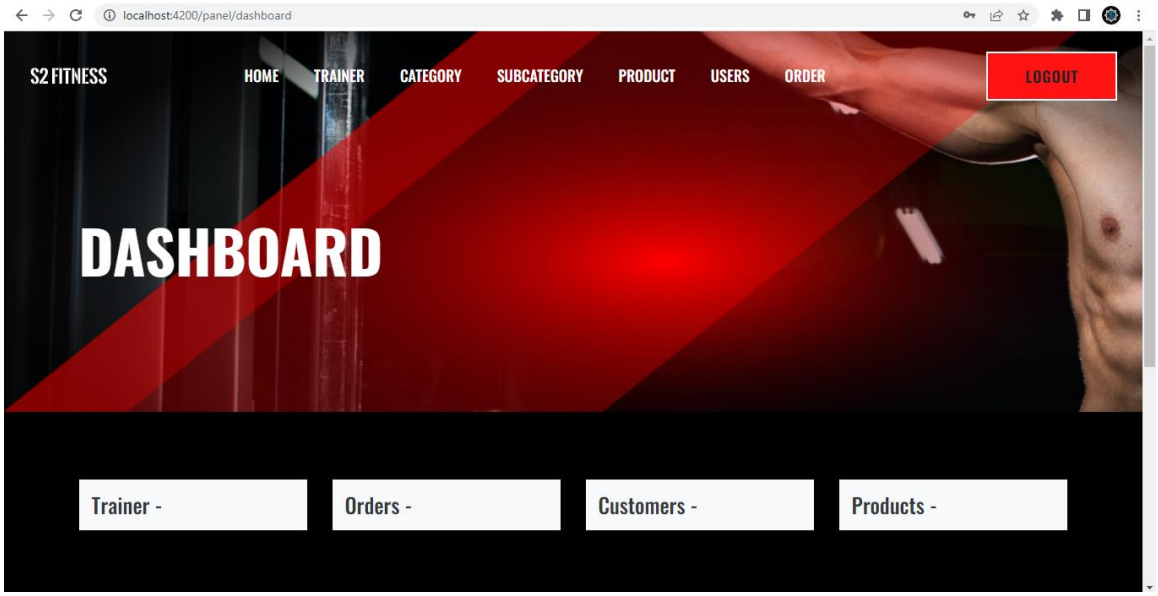
Register Page



Category Page



Admin Dashboard panel



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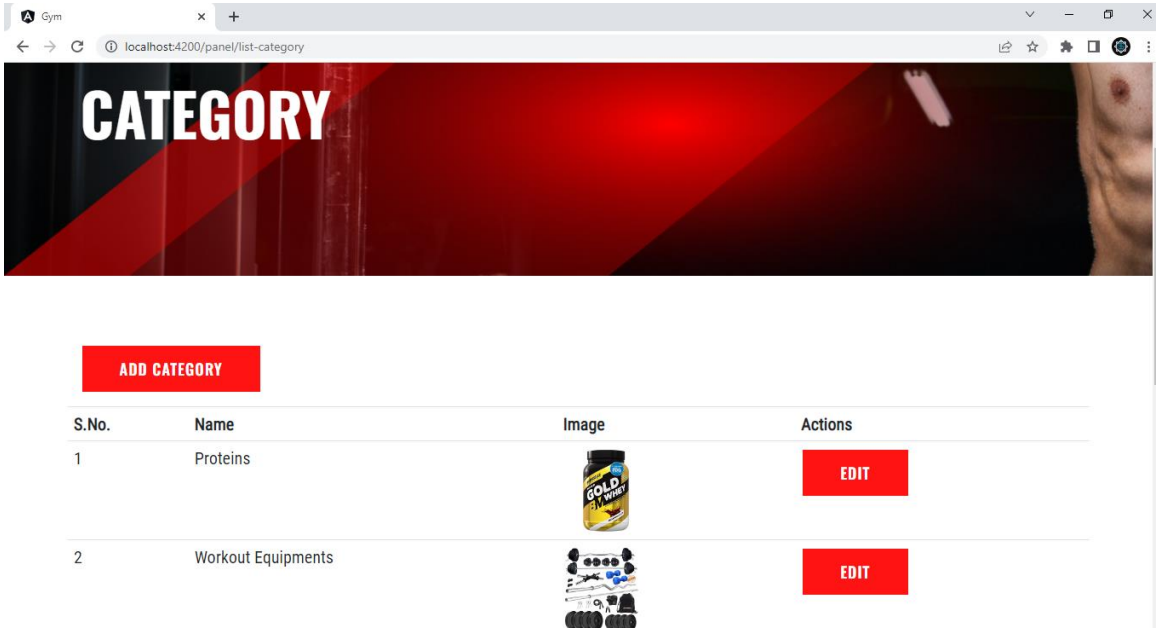

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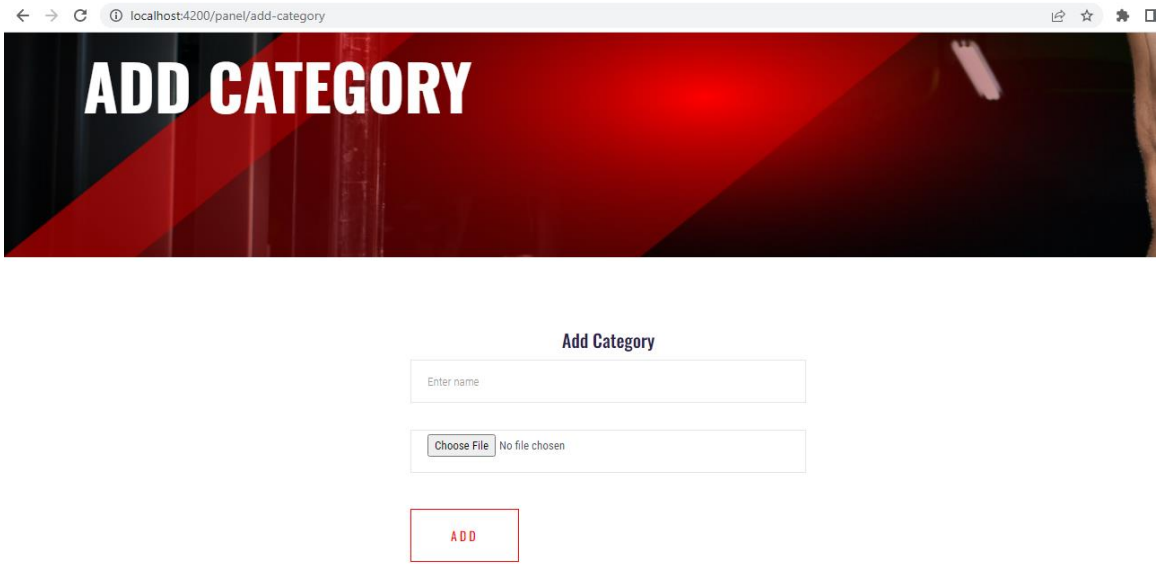

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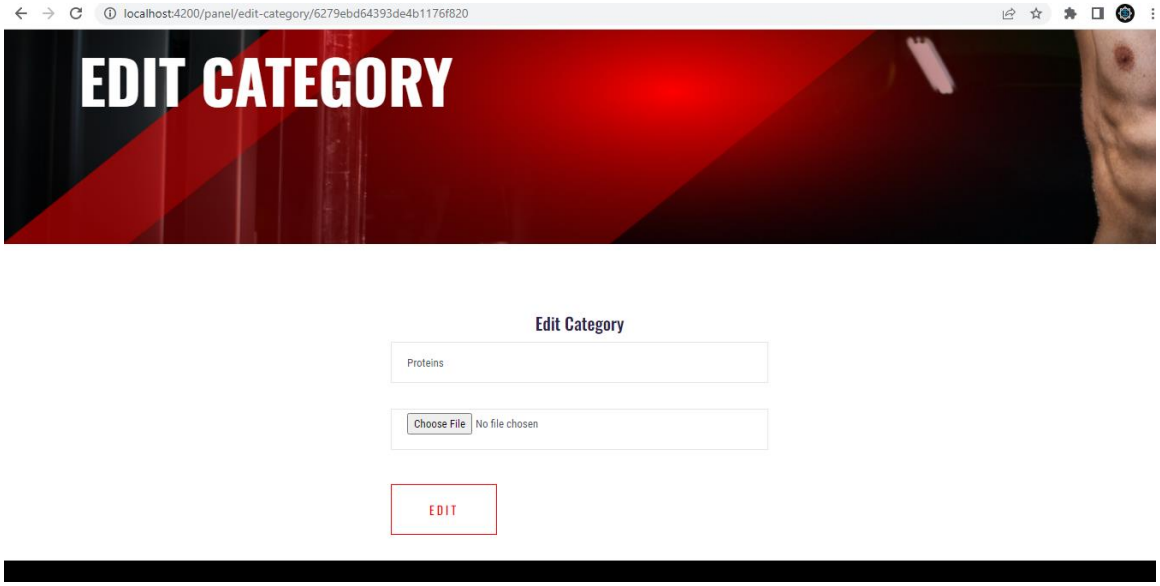
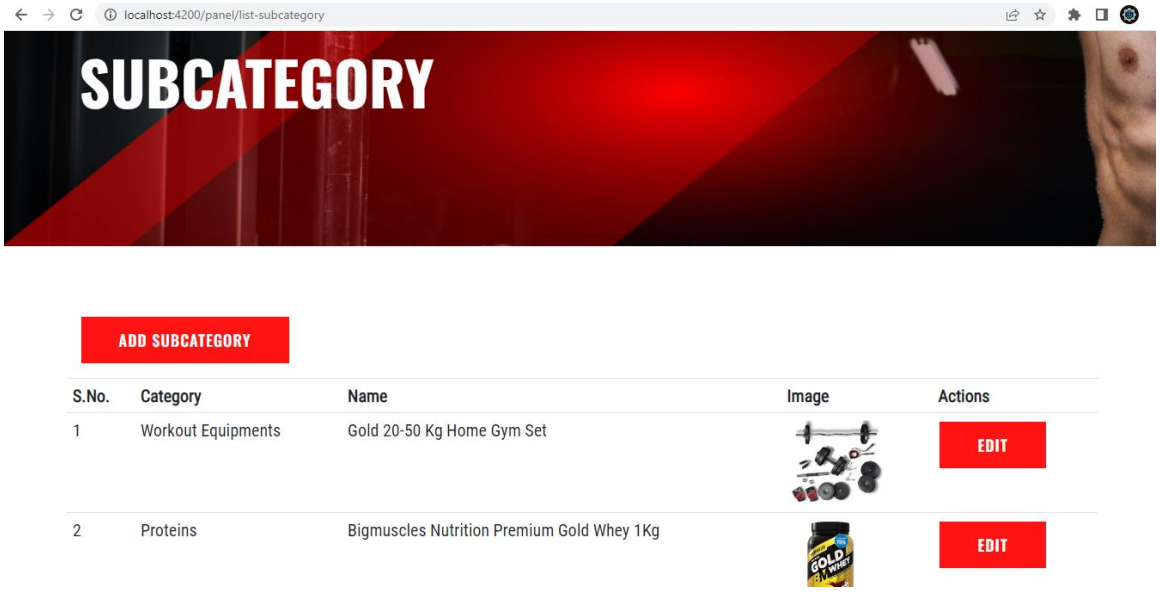


Subcategory page



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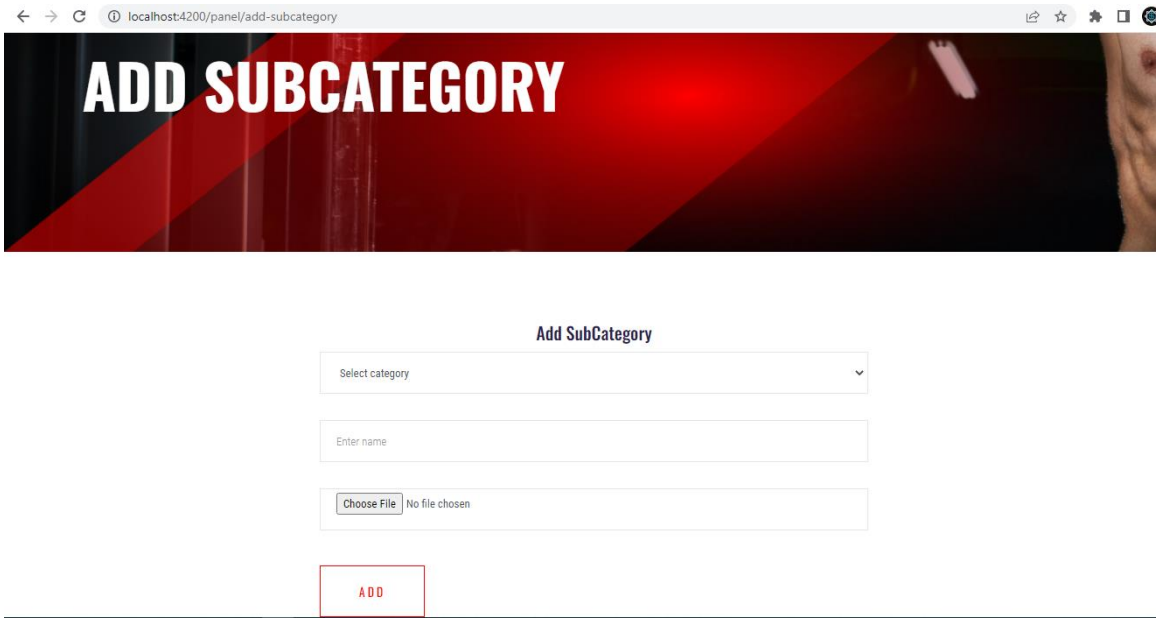

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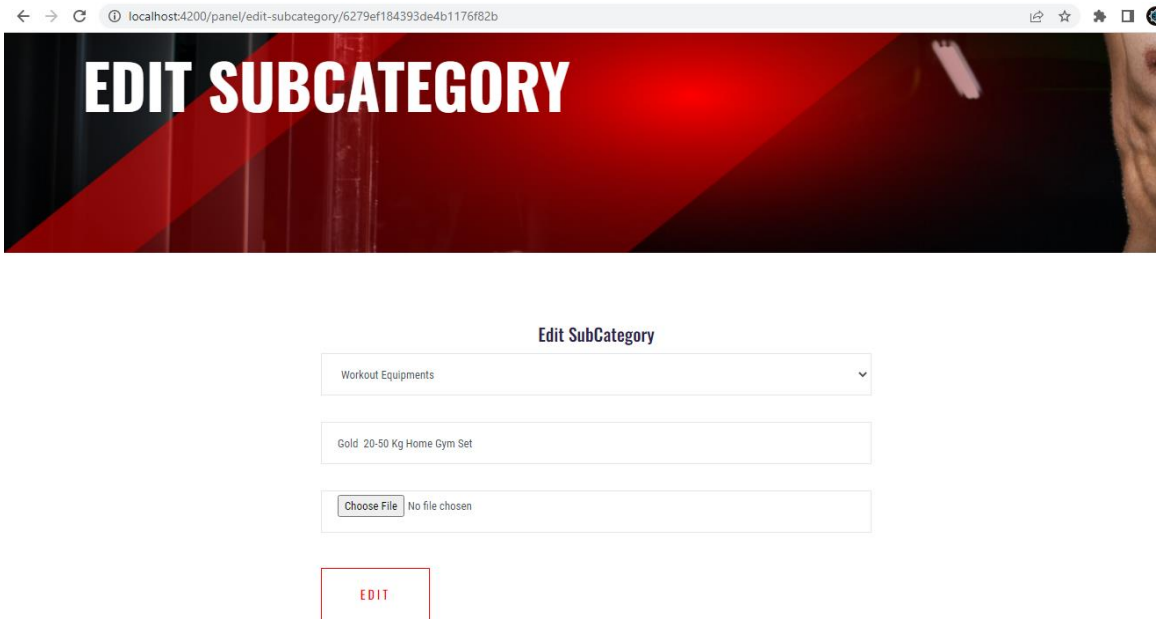
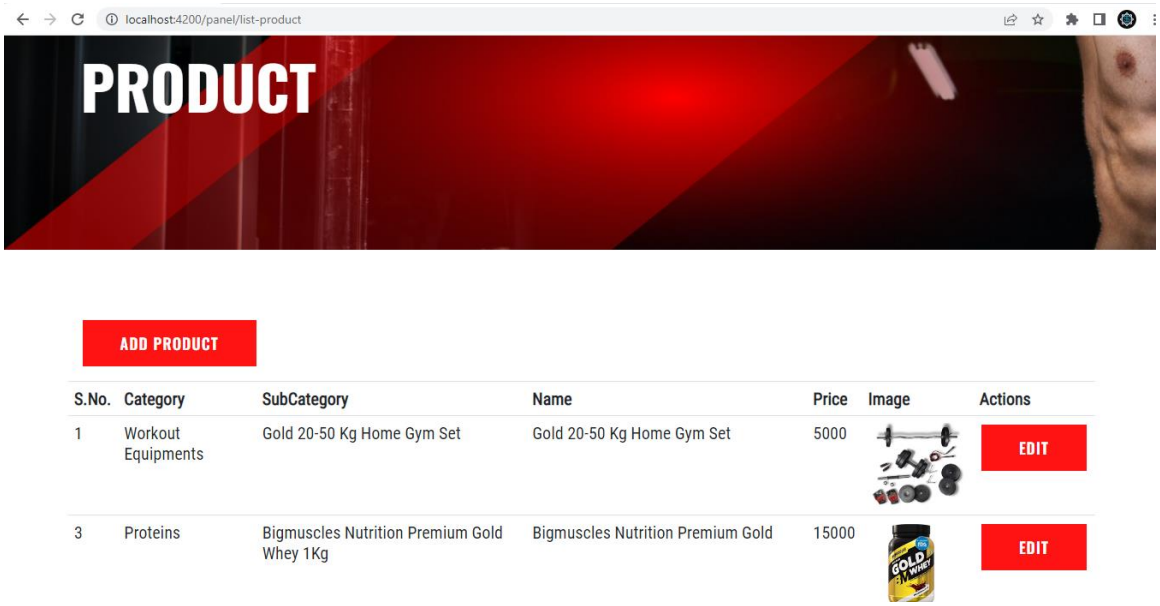
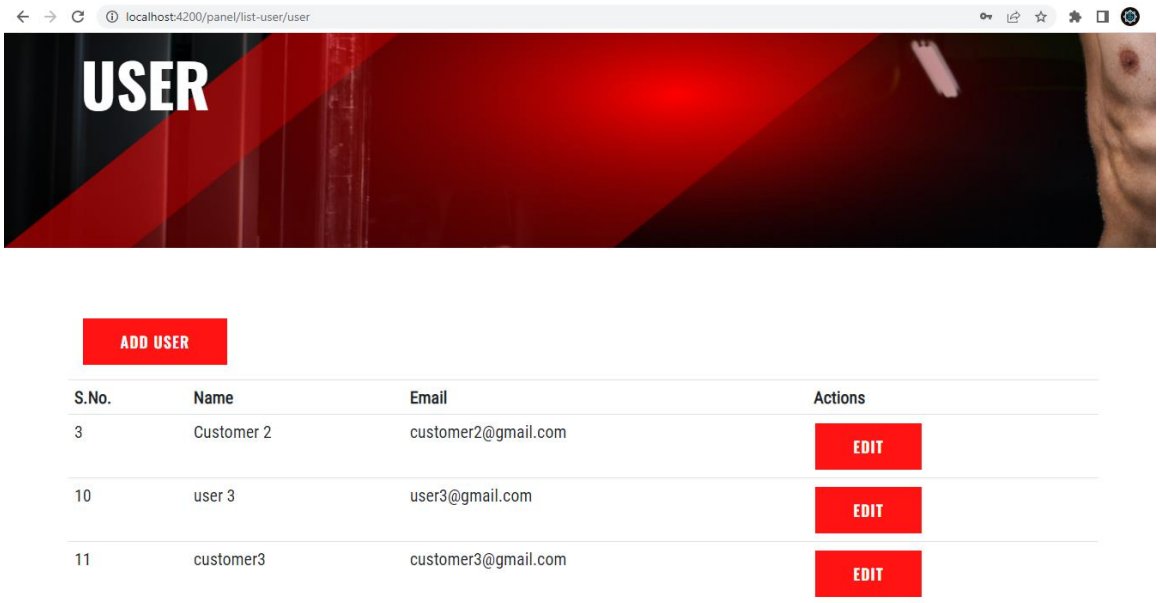


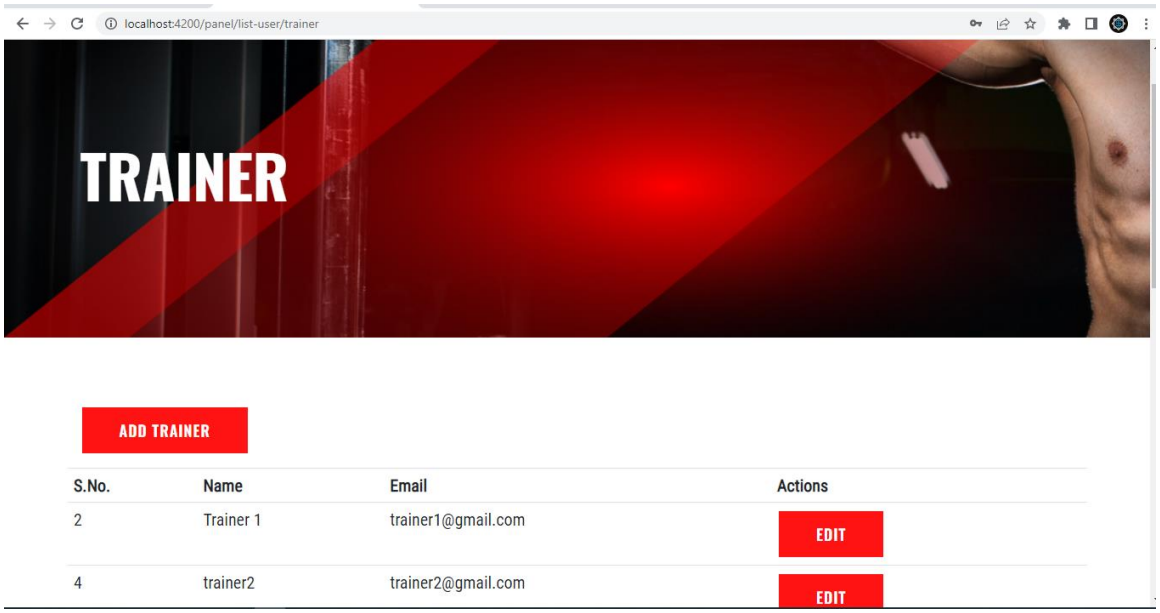
Product Page



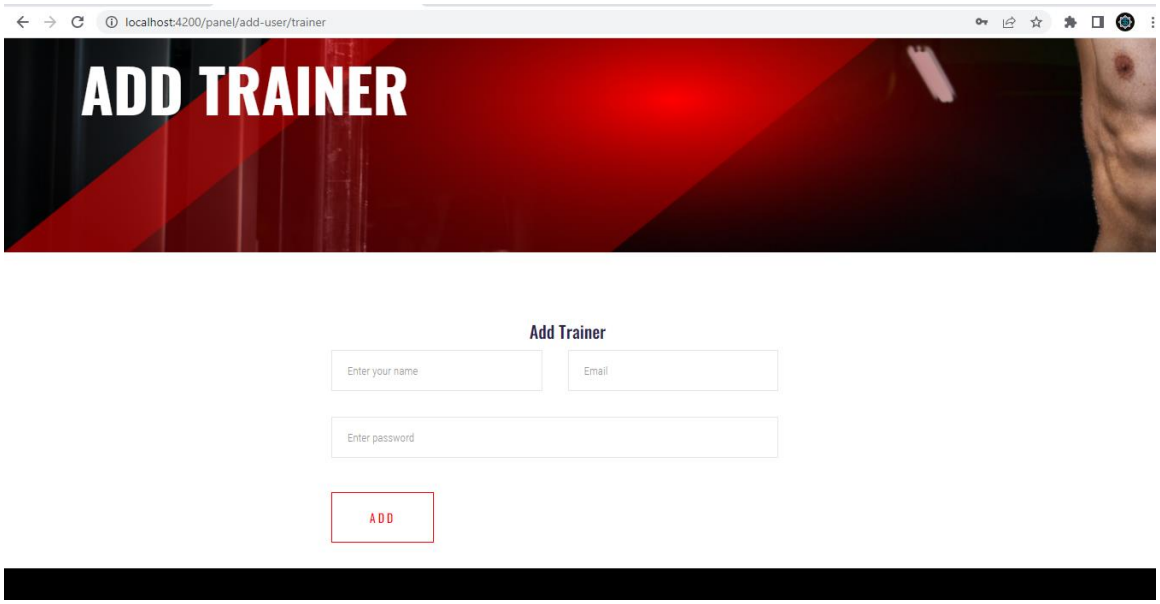
User page



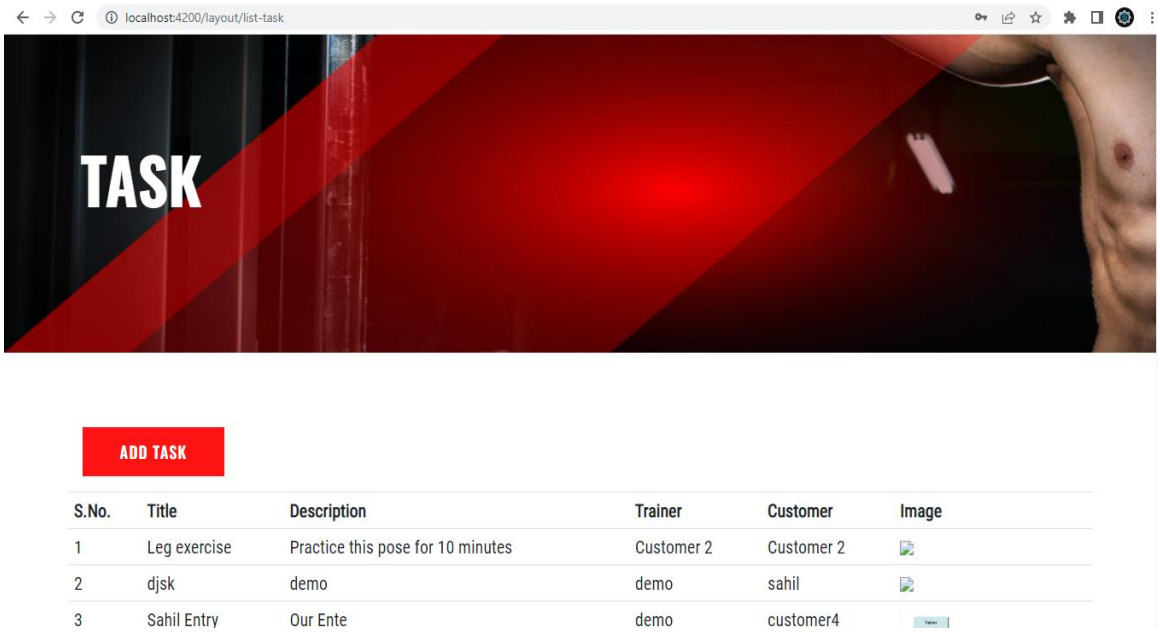
Trainer page



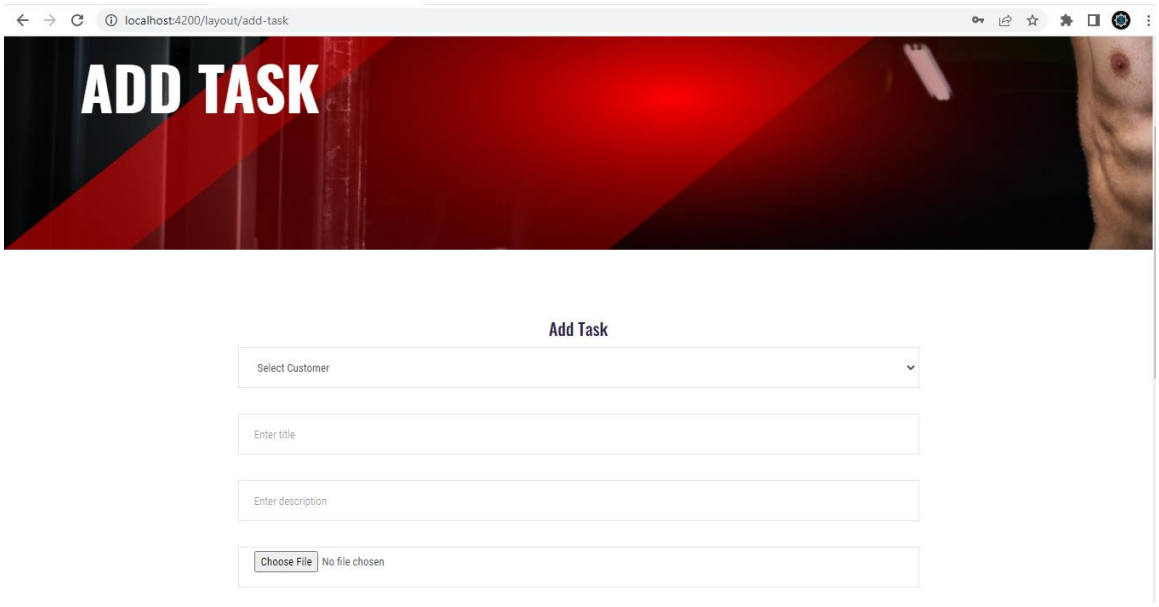
Add Trainer



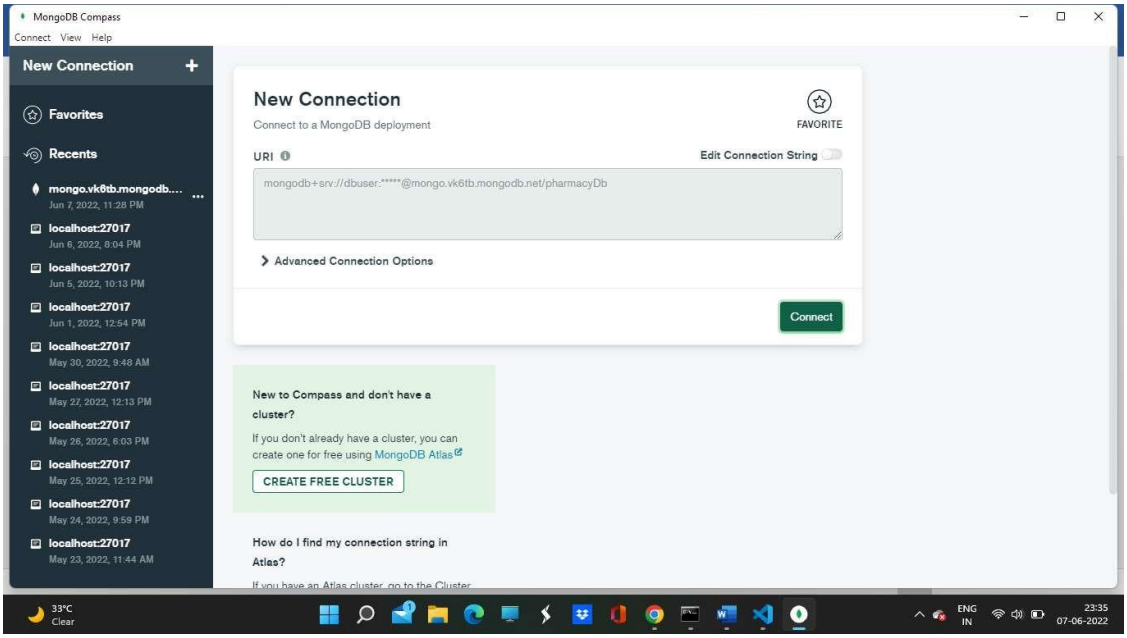
Task page



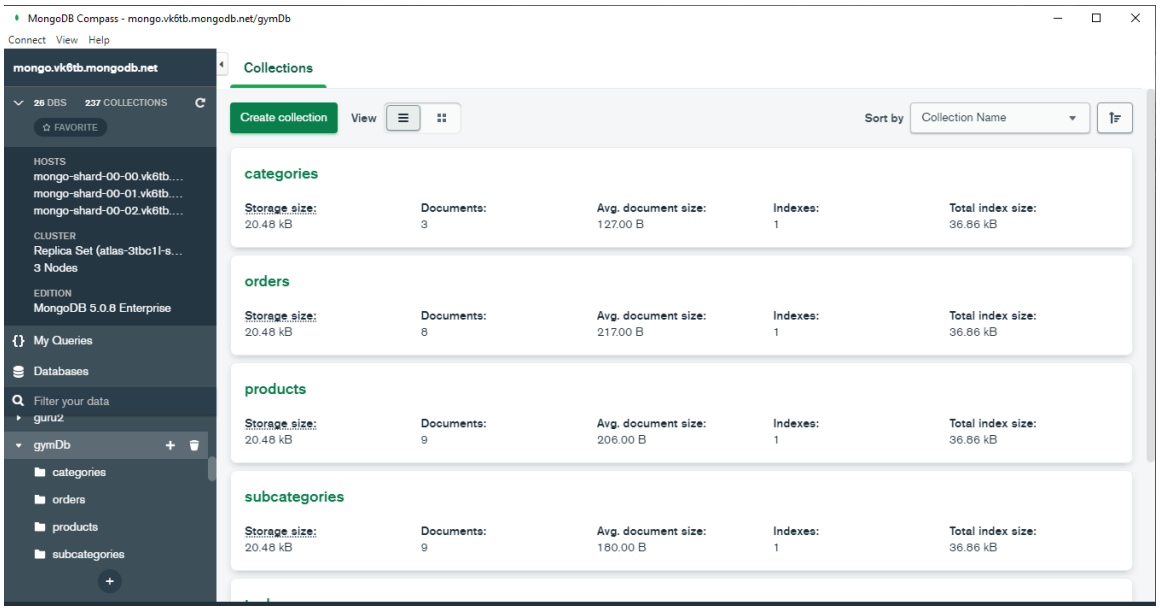
Trainer add task



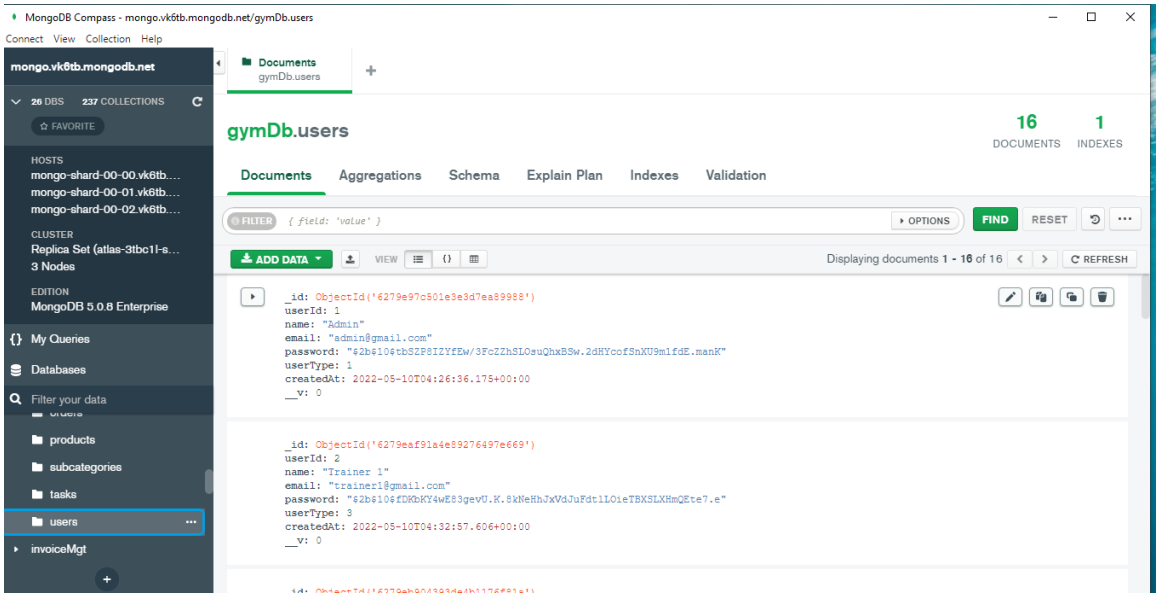
MongoDB connectivity



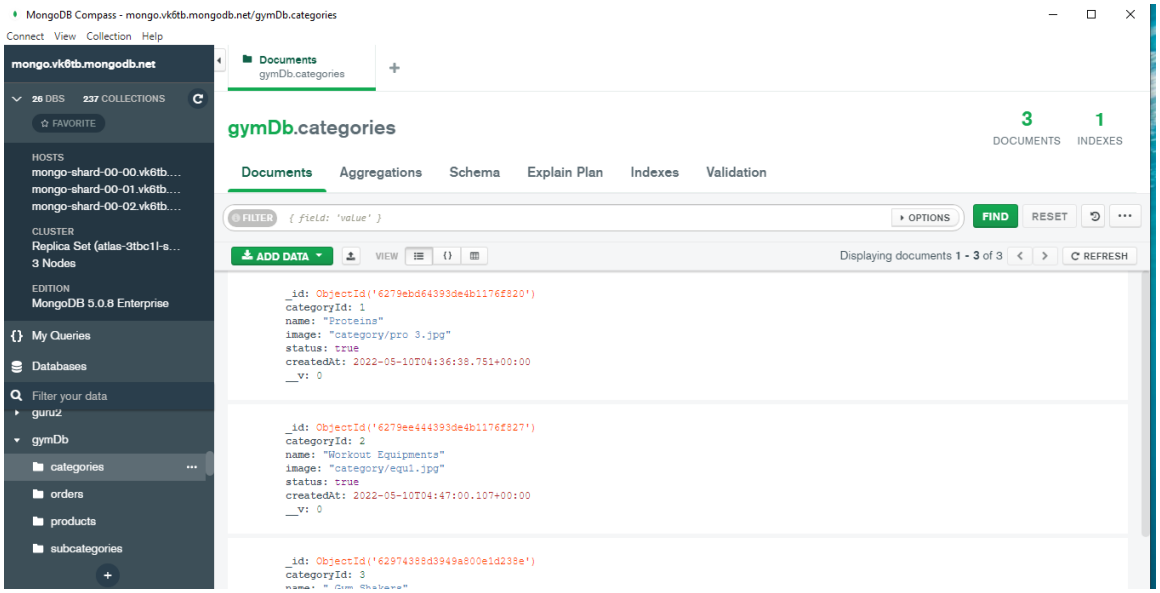
MongoDB Collection



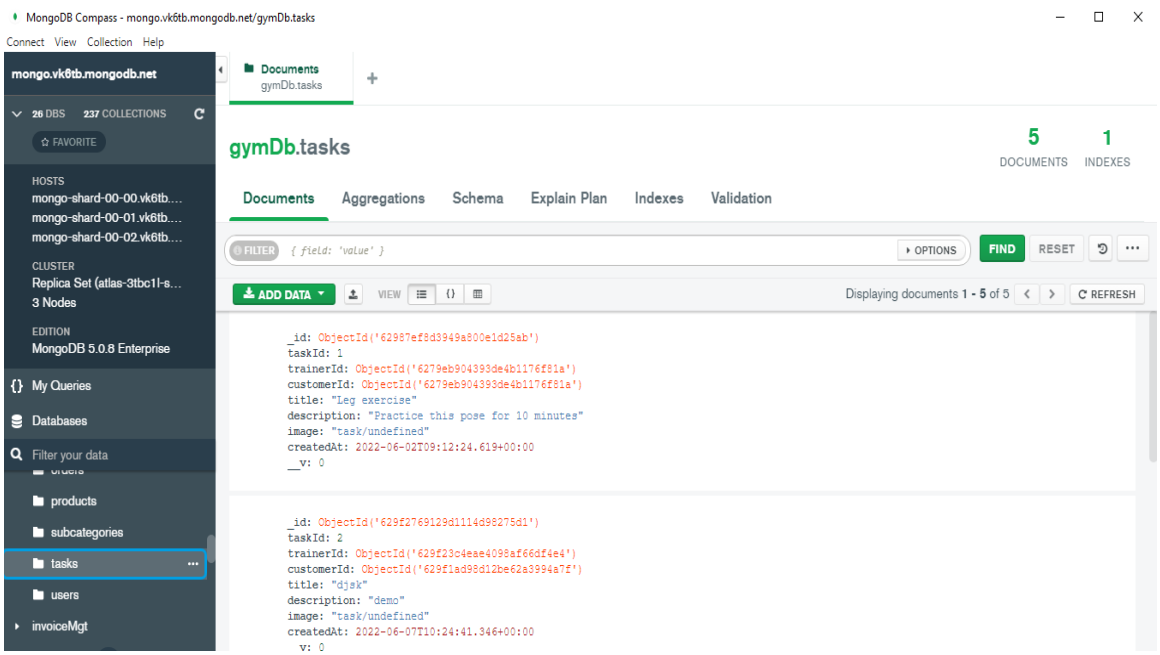
Users collection



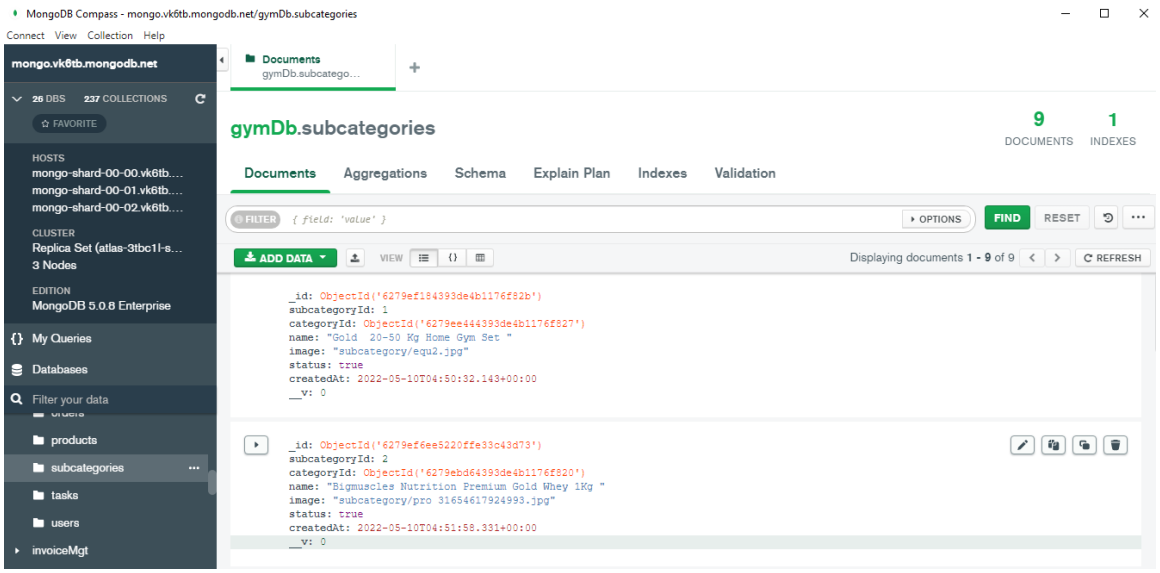
Category Collection



Task Collection



Subcat Collection



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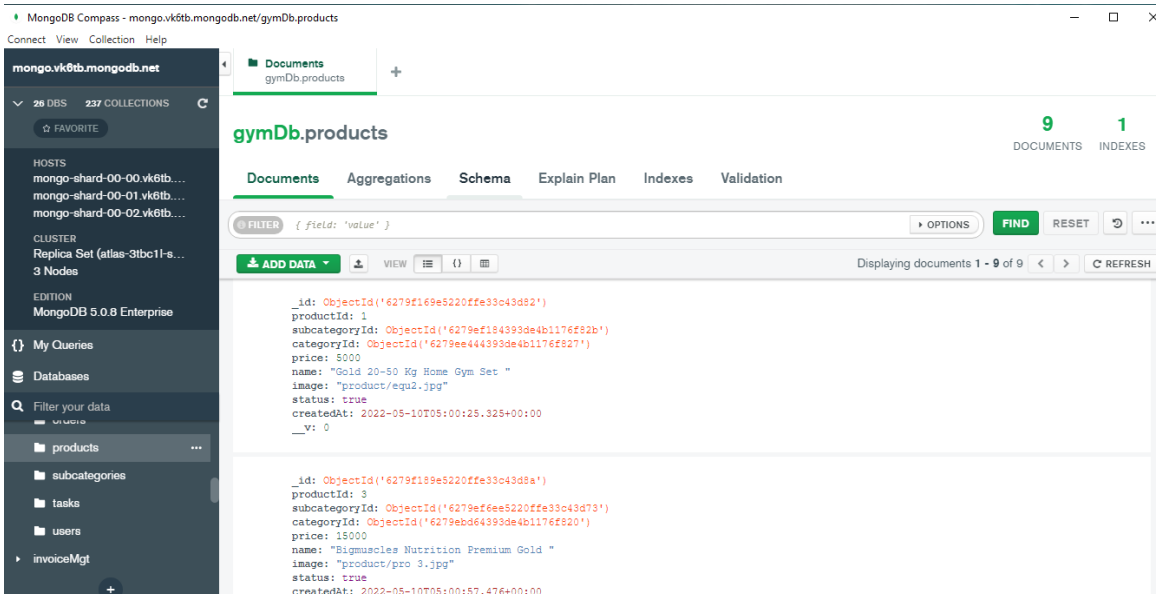

CHAPTER: 5 CONCLUSIONS and FUTURE SCOPE

CONCLUSIONS

- Being fit and exercising has an infinite amount of benefits to your health**.** It will help you live longer. It will help you enjoy the happiness and the sadness in life. It will keep your body strong and give a good impression of your sense of self-worth to those around you.

FUTURE SCOPE

- Completion of development process will result in a software package that will provide user-friendly environment, which is very easy to work with, even for people with very little knowledge of computer.
- Management of tasks is incorporated in the package and will deliver the required information in a very easy to access manner.
- This package will provide accuracy, efficiency, speed and easiness to the end user. it can be maintained successfully without much.
- In Future admin can also add the features of videos call and Private workout Session.

CHAPTER: 6 REFERENCES

Website:

- www.we3schools.com
- www.stackoverflow.com
- www.angular.io
- www.nodejs.org
- www.google.com