**Back-End Web Development Training Report**

An Internship Project Report

Under Subject

**Internship/Project (31832001)**

**Semester-VIII**

Submitted By

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190040107033

*In partial fulfilment for the award of the degree of*

**Bachelor of Engineering (8th Sem)**

in

**Computer Science and Engineering**

**B.H Gardi College of Engineering & Technology, Rajkot**

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**Gujrat Technological University**

[Fab 1st – Apr 30th]



**B.H Gardi College of Engineering & Technology, Rajkot**

# CERTIFICATE

This is to certify that the project report submitted along with the project entitled **Back-End Web Developer Training** has been carried out by **Parth Anilbhai Nakum** under my guidance in partial fulfilment for the degree of Bachelor of Engineering in , 8th Semester of Gujarat Technological University, Ahmadabad during the academic year 2022-23.

Varsha Oberoi Ms. Monika Shah Ms. Monika Shah

External Guide Internal Guide Head of Department



**B.H Gardi College of Engineering & Technology, Rajkot**

# DECLARATION

We hereby declare that the Internship submitted along with the Internship entitled **Back-End Web Developer Training** submitted in partial fulfilment for the degree of Bachelor of Engineering in **Computer Science and Engineering** to Gujarat Technological University, Ahmedabad, is a bonafide record of original project work carried out by me at **Radix software services Pvt Ltd** under the supervision of and that no part of **Valarsh Oberoi** as **External Guide** & **Ms. Monika Shah** as **Internal Guide** this report has been directly copied from any students’ reports or taken from any other source, without providing due reference.



**Name of Student**

Parth Anilbhai Nakum Signature of Student

# Acknowledgement

I would like to express my heartily thanks with a deep sense of gratitude and respect to all those who has provided me immense help and guidance during my project. I would like to express my sincere thanks to my trainer or External Guide **Varsha R Oberoi** for providing vision about the industry and for giving me an opportunity to undertake such a great challenging and innovative work. I would to extends to thanks **Radix software services Pvt Ltd, Ahmedabad** to provide me to opportunity of internship. I am grateful for the guidance, encouragement, understanding, and insightful support given in the development process.

I would like to extend my gratitude to **Ms. Monika Shah** Internal Guide of this training & **Ms. Monika Shah** Head of Computer Engineering B.. Gardi College of Engineering & Technology, Rajkot for his continuous encouragement and motivation.

Last but not the least I would like to mention here that I am greatly indebted to each and everybody who has been associated with training at any stage but whose name does not find a place in this acknowledgement and lastly, Thank you so much.

**You’re Sincerrly**

**Parth Anilbhai Nakum**

# Chapter 1 - Introduction

## Introduction to web Technology Stack

### **Web development**

Web development is the art and science of creating and maintaining websites that work on the internet or private networks. Web development refers to the creating, building, and maintaining of websites. It includes aspects such as web design, web publishing, web programming, and database management. It is the creation of an application that works over the internet i.e., websites.

Web developers use various languages and tools to design, code, and test the web pages, such as HTML, CSS, JavaScript, PHP, and more.

Web development can be divided into three main categories: front-end, back-end, and full-stack

* **Front-end** development deals with the appearance and interaction of the web pages, using languages like HTML, CSS, and JavaScript.
* **Back-end** development handles the logic and data of the web pages, using languages like PHP, Python, Ruby, and more.
* **Full-stack** development combines both front-end and back-end skills, and can create complete web applications from scratch

### **Full Stack Web Development**

**Front End**

It refers to the development of both front end (client side) and back end (server side) portions of web application.

**Front End Technologies HTML**

* HTML
* CSS
* JavaScript

Figure 1 Front End Technology

* **Front End Frameworks**
* Angular
* React Js
* Bootstrap
* Tailwind
* JQuery
* SASS

**Back End**

It refers to the server-side development of web application or website with a primary focus on how the website works. It is responsible for managing the database through queries and APIs by client-side commands. This type of website mainly consists of three parts front end, back end, and database

* **Back End Technologies**

Figure 2 Back End Technology

* PHP
* C++
* NodeJS
* .NET
* Python

**Tools for the Web development**

For every War we required the Weapon, Same as for web development we required the tools as a weapon. In Radix web we follow the SOP for development. As per SOP we required Quality first, so that for Quality development We used as follow tools

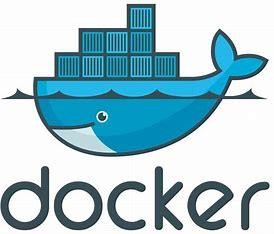
* For Project Management: Redmine
* For Creating Code: Visual Studio Code
* For Version Control: Git Hub
* For Quality Deployment: Docker
* For Quality Check: SonarQube
* For network deploy: Netlify / Stack blitz

Figure 3 Tool For the Web development

# Chapter 2 – GIThub

## Version Control System

Let assume, you work with major project with multiple developer. Let say you have one of the developers, suppose you created the Navbar and Other developer needs it. Now you share your code with Classical way by ZIP. Some what you’re working strategy is okay, but in case of full development you need to share your code every time, and compare with other code also. So, this way is so frustrating. Now we need some special kind of tool. This tool called as a Version Control System.

### **Version Control System**

We can define Version control systems as They are a category of software tools that helps in recording changes made to files by keeping a track of modifications done in the code. A version control system is a kind of software that helps the developer team to efficiently communicate and manage (track) all the changes that have been made to the source code along with the information like who made and what changes have been made.

**Benefit of VCS**

* Enhances the project development speed by providing efficient collaboration.
* Leverages the productivity, expedites product delivery, and skills of the employees through better communication and assistance.
* Reduce possibilities of errors and conflicts meanwhile project development through traceability to every small change.
* Employees or contributors of the project can contribute from anywhere irrespective of the different geographical locations through this VCS.

### **Types of Version Control System**

1. Local Version Control System
2. Centralized Version Control System
3. Distributed Version Control System

**Local Version Control System** is the one of the simplest forms and has a database that kept all the changes to files under revision control.

**Centralized version control systems** contain just one repository globally and every user need to commit for reflecting one’s changes in the repository. It is possible for others to see your changes by updating.

**Distributed version control systems** contain multiple repositories. Each user has their own repository and working copy. Just committing your changes will not give others access to your changes.

### Git Vs. GitHub: Demystifying the Differences - DZone Open Source**GitHub**

Figure 4 GitHub [Version control Tool]

Git is a specific open-source version control system created by Linus Torvalds in 2005.Specifically, Git is a **distributed version control system**, which means that the entire codebase and history is available on every developer’s computer, which allows for easy branching and merging.

### **Chapter Task**

**Module Name: Redmine Git - 1.0**

**Day – Task**

**Assignment – 1**

Create a flow chart and algorithm for addition of two numbers, area of circle, do the sum of all the even numbers.

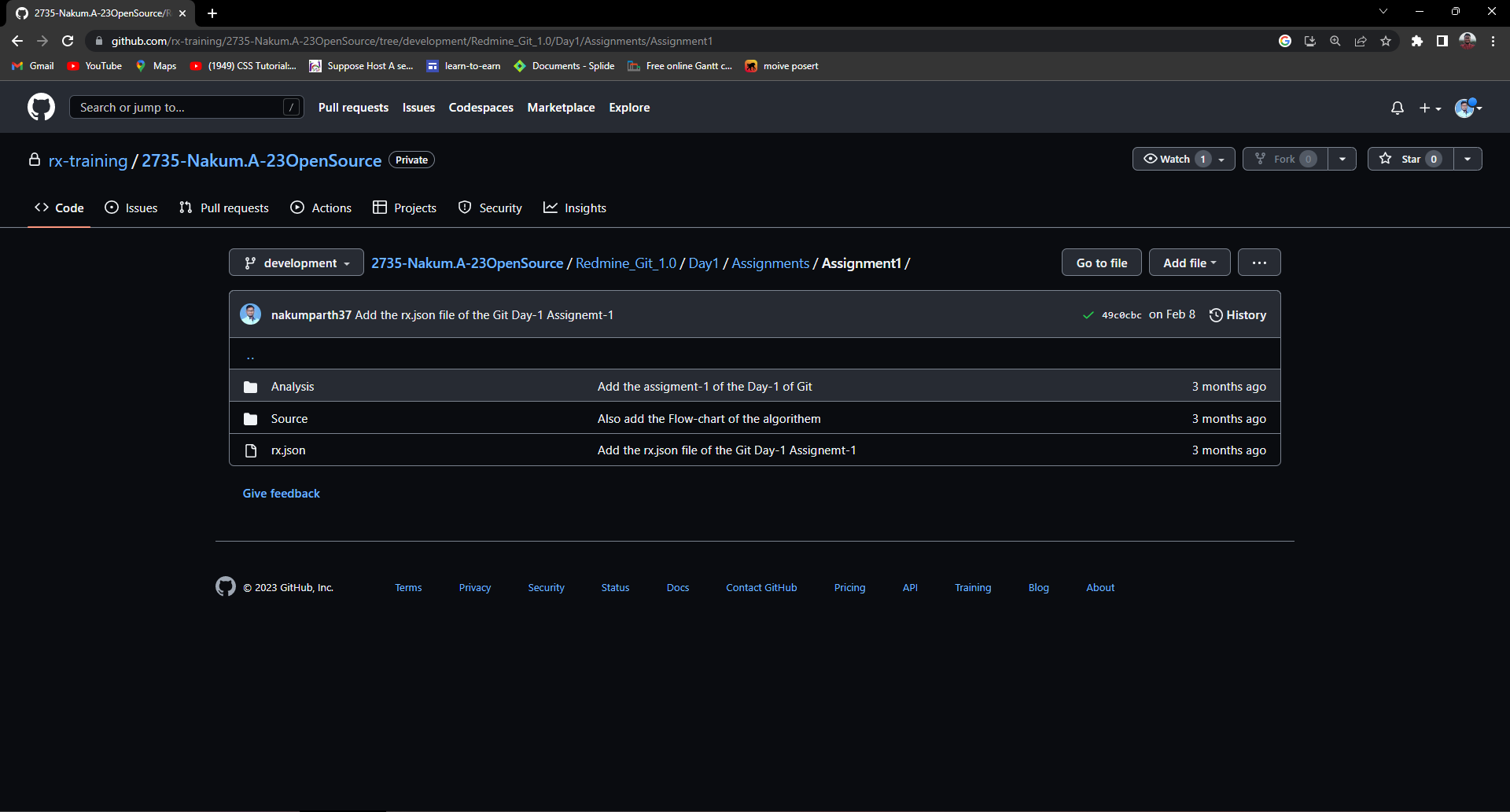


Figure 5 GitHub day-1 Assignment-1

**Assignment – 2**

Fork the following repository and Practice to conflict.

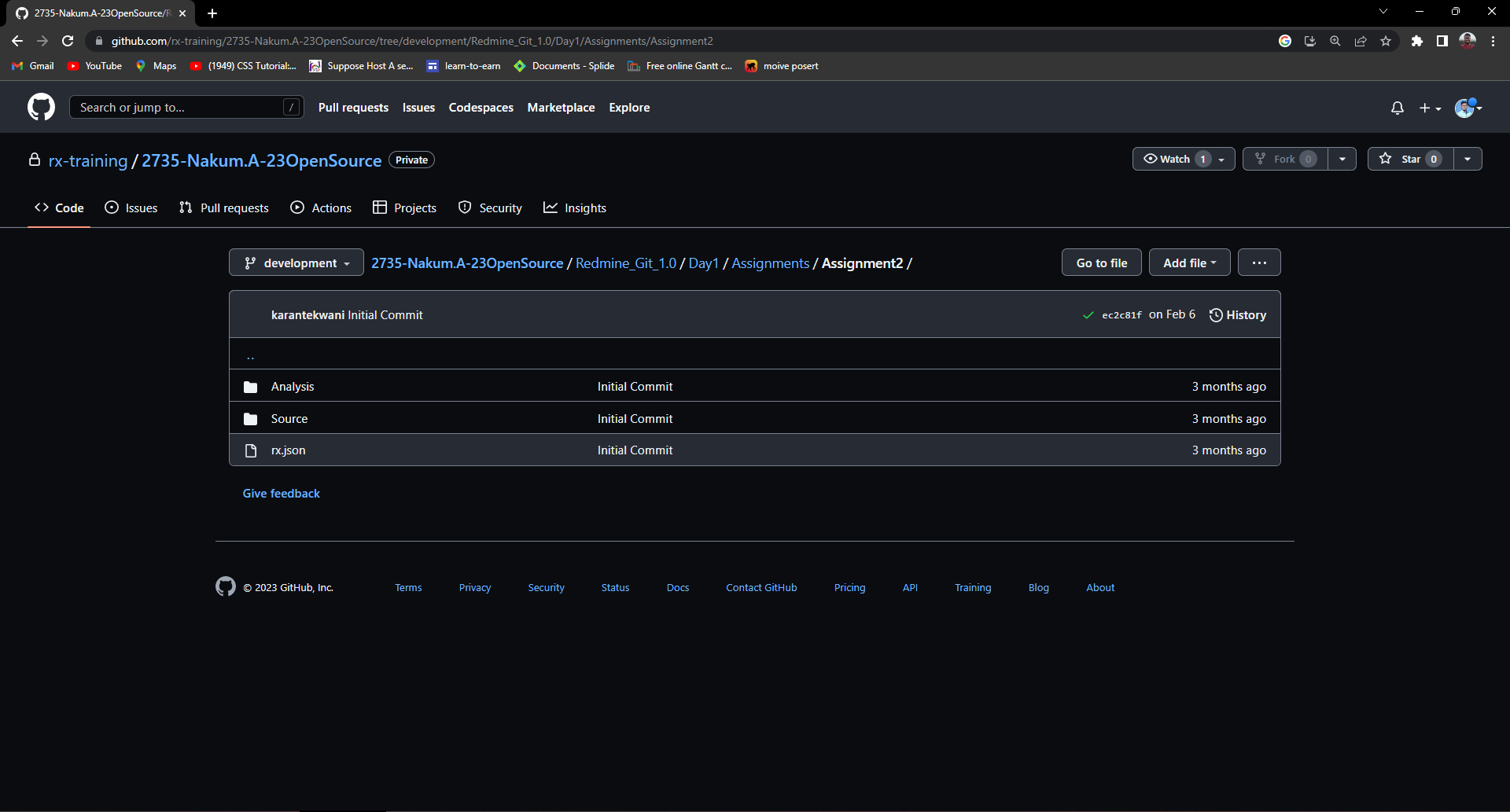


Figure 6 GitHub Day-1 Assignmnet-2

Chapter 3 – HTML

## Skeleton of Webpage

As per Our Human Body, we have Bone Skeleton. This is basic building block of our Human Body. Similarly In Websites there is main building block is Markup Page. This markup page usually designs by language called Hyper Text Markup Language (HTML).

### **HTML**

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 Basic Page format Structure**

The basic structure of an HTML page is laid out below. It contains the essential building-block elements (i.e. doctype declaration, HTML, head, title, and body elements) upon which all web pages are created.

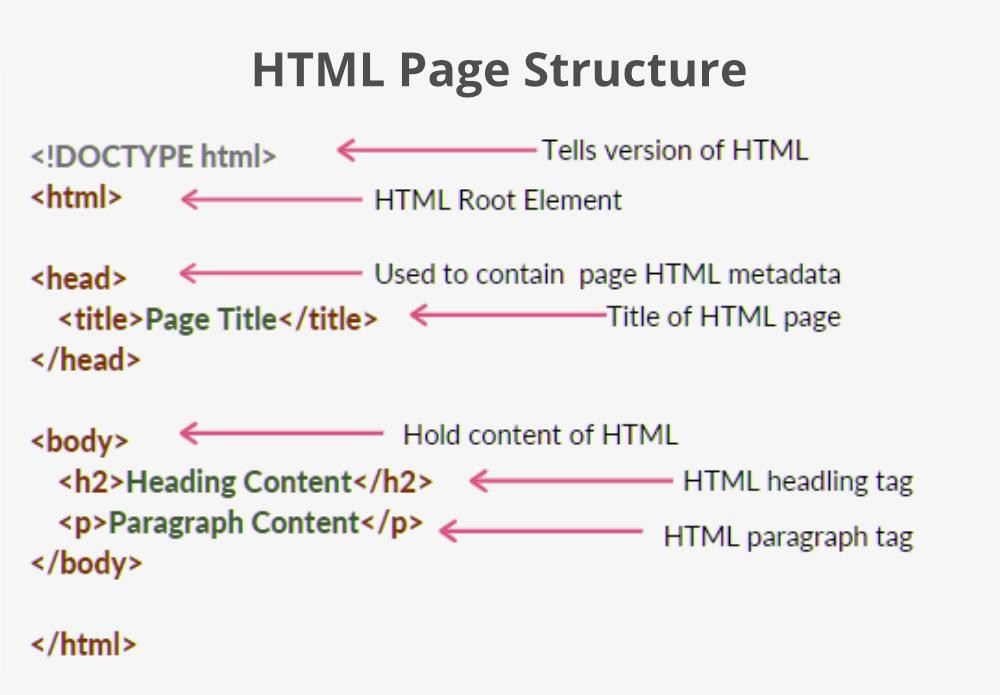


Figure 7 HTML Structure

### 

### **Chapter Task**

**Module Name: FT-HTML 1.0**

**Day – Task**

**Assignment – 1**

Design a form for storing employee details. (Employee name, age, Gender, designation, salary, location, Email ID, Date of Joining and contact number)

* + Validation required.
  + Age should be a number.
  + Each field should contain value
  + Email ID should be in proper format
  + Date of joining should be in date format
  + Location should be in the drop down list
  + Use radio buttons for Gender.

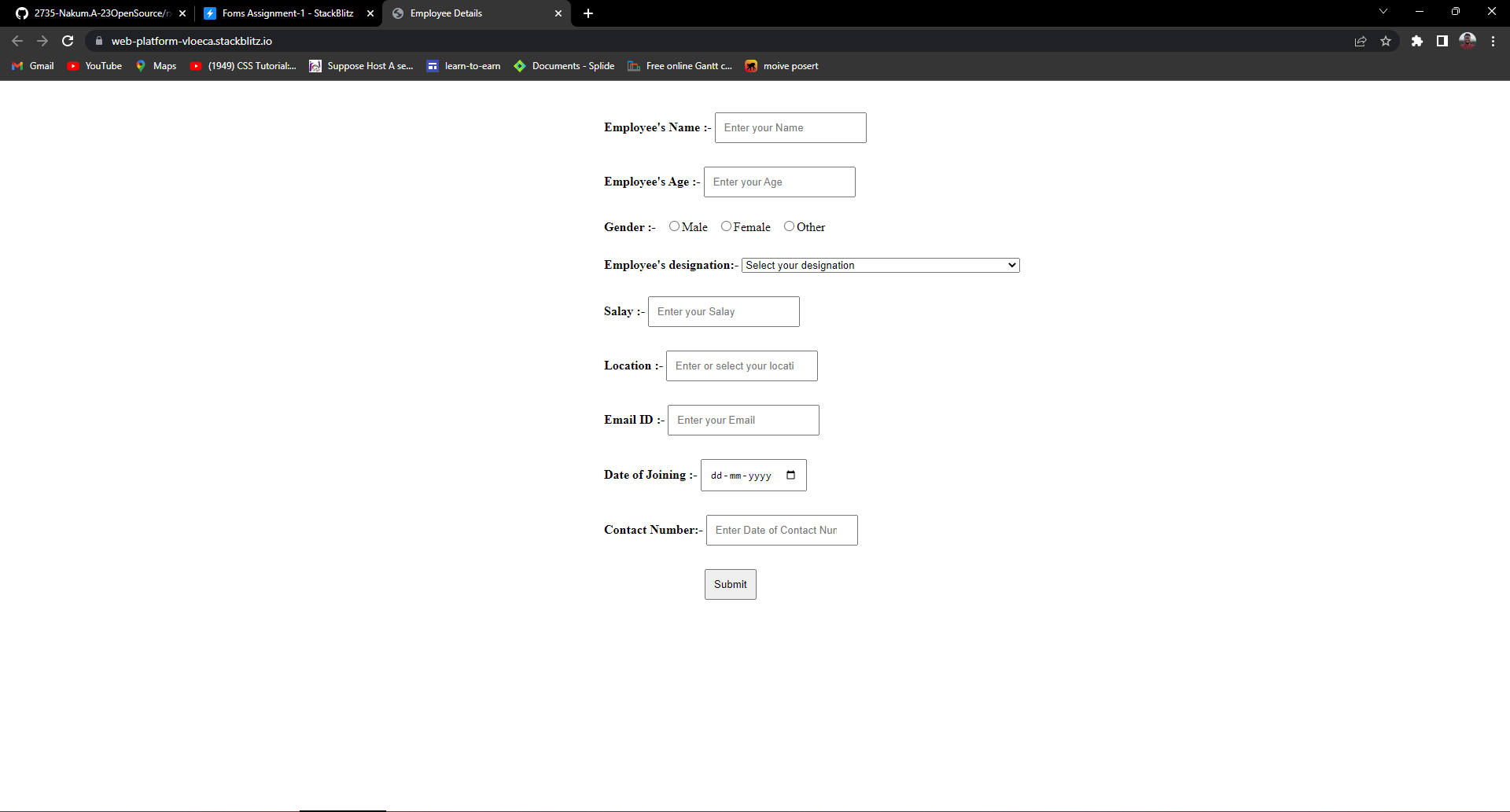


Figure 8 HTML Day-1 Assignment-1

**Assignment – 2**

Create personalized resume, which must be attractive. Use all the HTML tags and add one short video of your project done into resume.



Figure 9 HRML Day-2 Assignment-1

# Chapter 4 – CSS & Its Framework

## Stylesheet of Webpage

After Skeleton ready, we have layer of cloth on our body. Similarly, CSS beautifying the webpages to the attractive manner.

### **CSS**

Cascading Style Sheets, fondly referred to as CSS, is a simply designed language intended to simplify the process of making web pages presentable. CSS allows you to apply styles to web pages. More importantly, CSS enables you to do this independent of the HTML that makes up each web page.

While html uses tags, CSS uses rulesets. CSS is easy to learn and understand, but it provides powerful control over the presentation of an HTML document.

**Benefits of CSS**

* Save time
* Easy maintenance
* Different Frameworks
* Offline Work
* High Quality Colors

**CSS Syntax**

CSS comprises style rules that are interpreted by the browser and then applied to the corresponding elements in your document.

A style rule set consists of a selector and declaration block.

Selector {

Property: value;

}

For including CSS there are three main types, you can include stylesheet by following way as per need.

* Inline CSS
* In-file CSS
* External CSS

**Chapter Task**

**Module Work: FT CSS 2.1**

**Day-Task**

**Assignment-1**

Create personalized resume, which must be attractive. Use all the HTML tags and apply CSS which we have learned so far.



Figure 10 CSS Da-1 Assignemt-1

**Assignment-2**

Create Basic layout of the application which contain header, footer, left-bar and sidebar. Header keep brand logo and navigation bar for home, aboutus and contact us. Navigation should work properly.

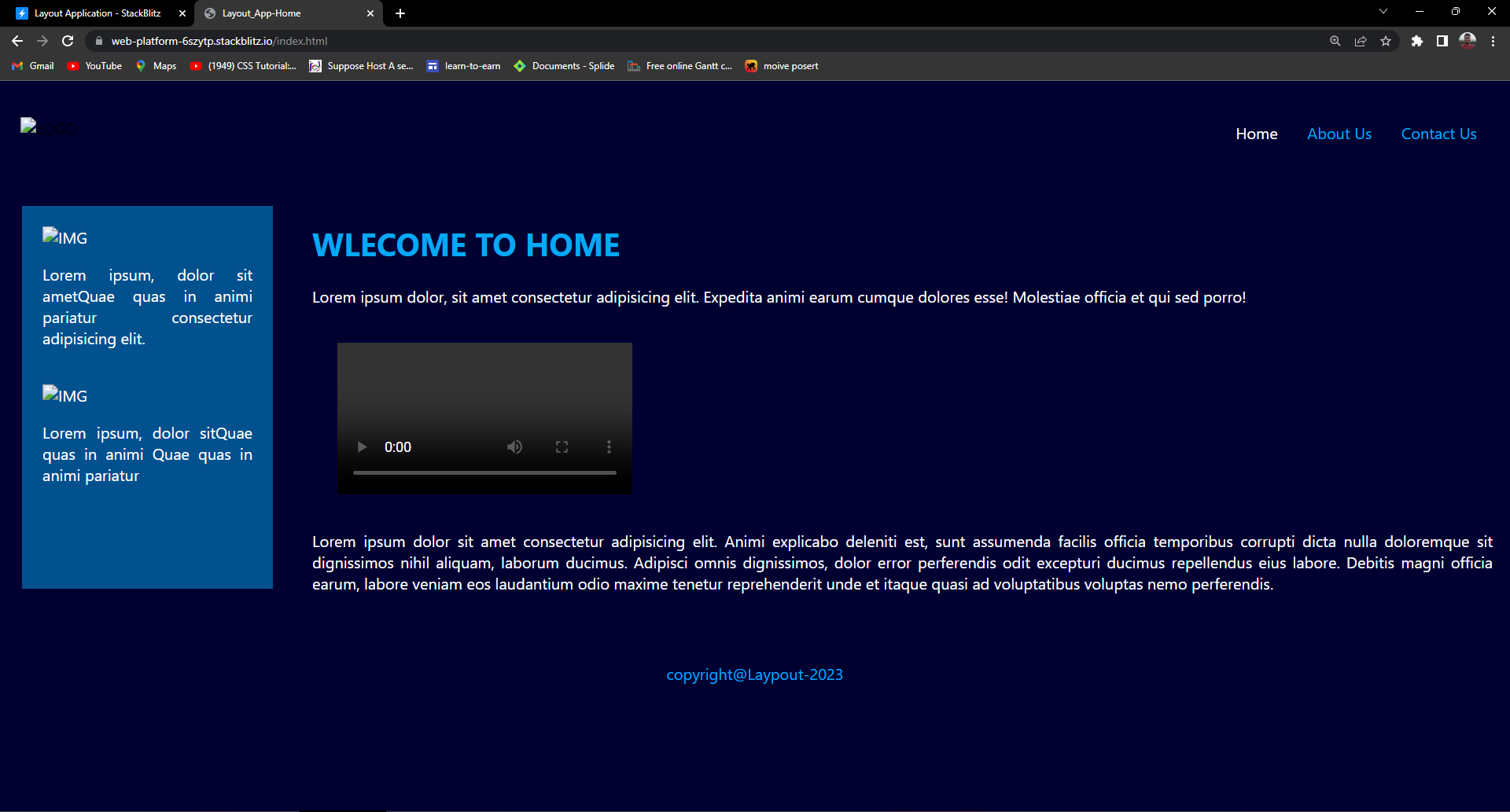
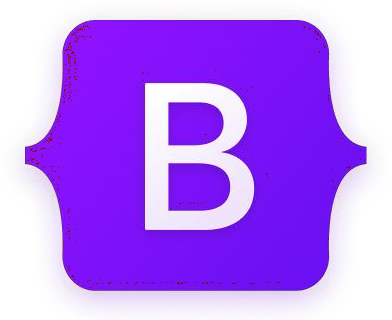


Figure 11 CSS Assignment-2

### **Bootstrap: A CSS Framework**

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. Nowadays, the websites are perfect for all browsers (IE, Firefox, and Chrome) and for all sizes of screens (Desktop, Tablets, Phablets, and Phones).

By using this framework, we can easily manipulate the styling of any web page, like font style, text colour, background colour, flex, grid system, etc.

**Feature of Bootstrap**

* It is Faster and Easier way for Web-Development.
* It creates Platform-independent web-pages.
* It creates Responsive Web-pages.
* It designs responsive web pages for mobile devices too.
* It is a free and open-source framework available on [www.getbootstrap.com](http://www.getbootstrap.com/)

**How to Include BT ?**

* There are two ways to include Bootstrap in the website.
* Using Content Delivery Network (CDN).
* Using Manually Installation using node package manager (npm).

### **Chapter Task**

**Module Name: FT-Bootstrap 2.2**

**Day-Task**

**Assignment-1**

Create the Coursera Clone.

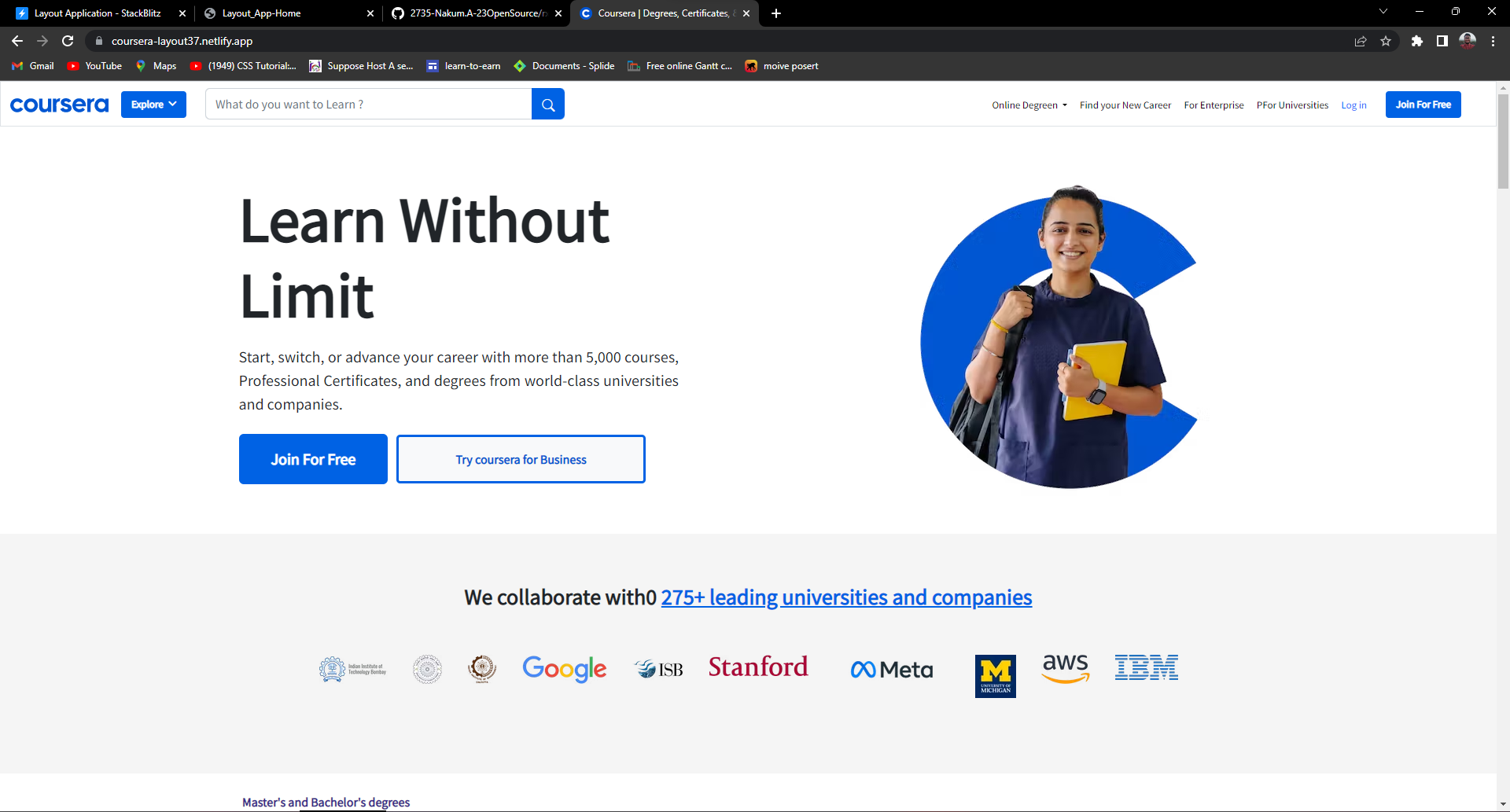
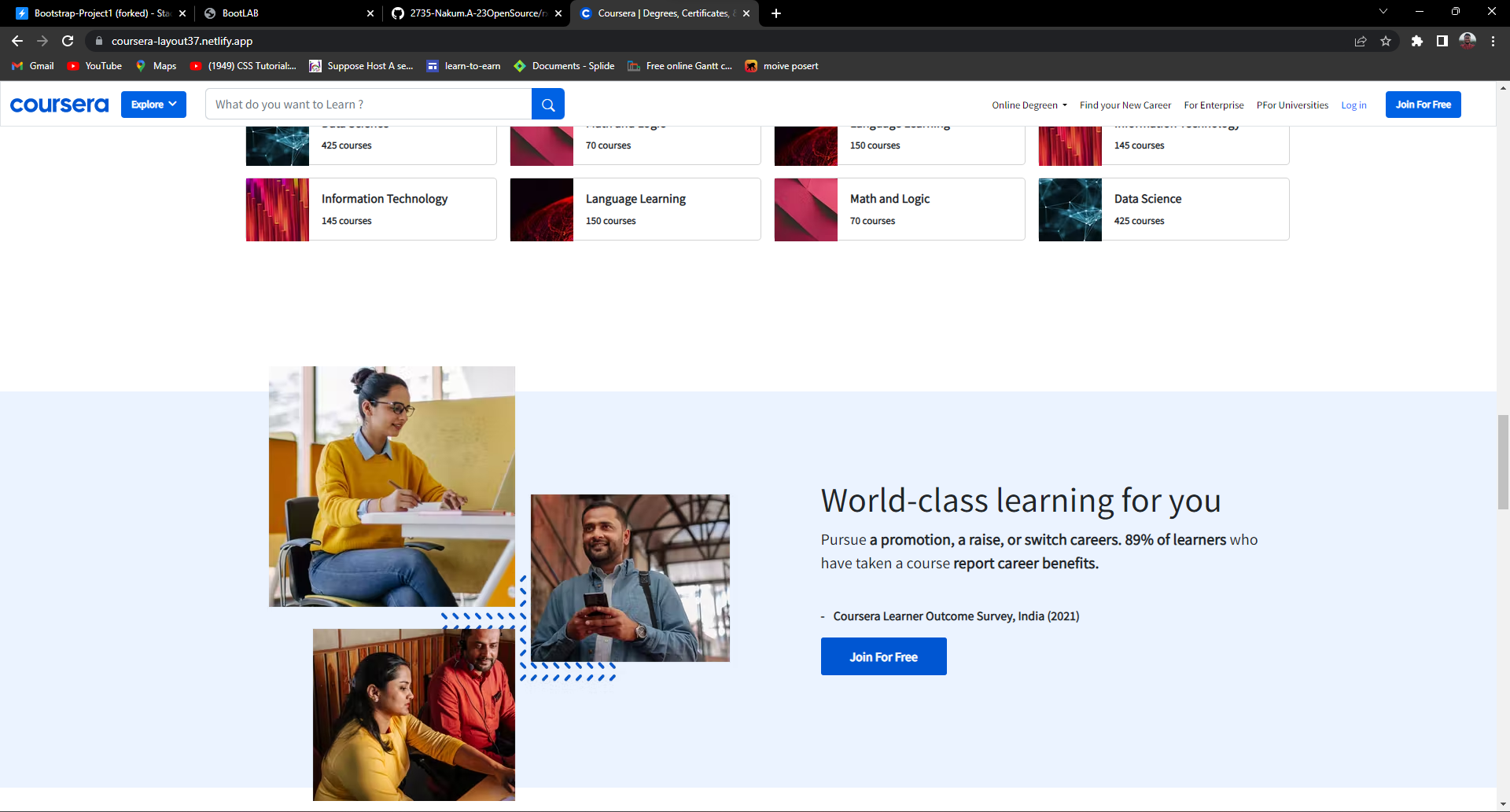
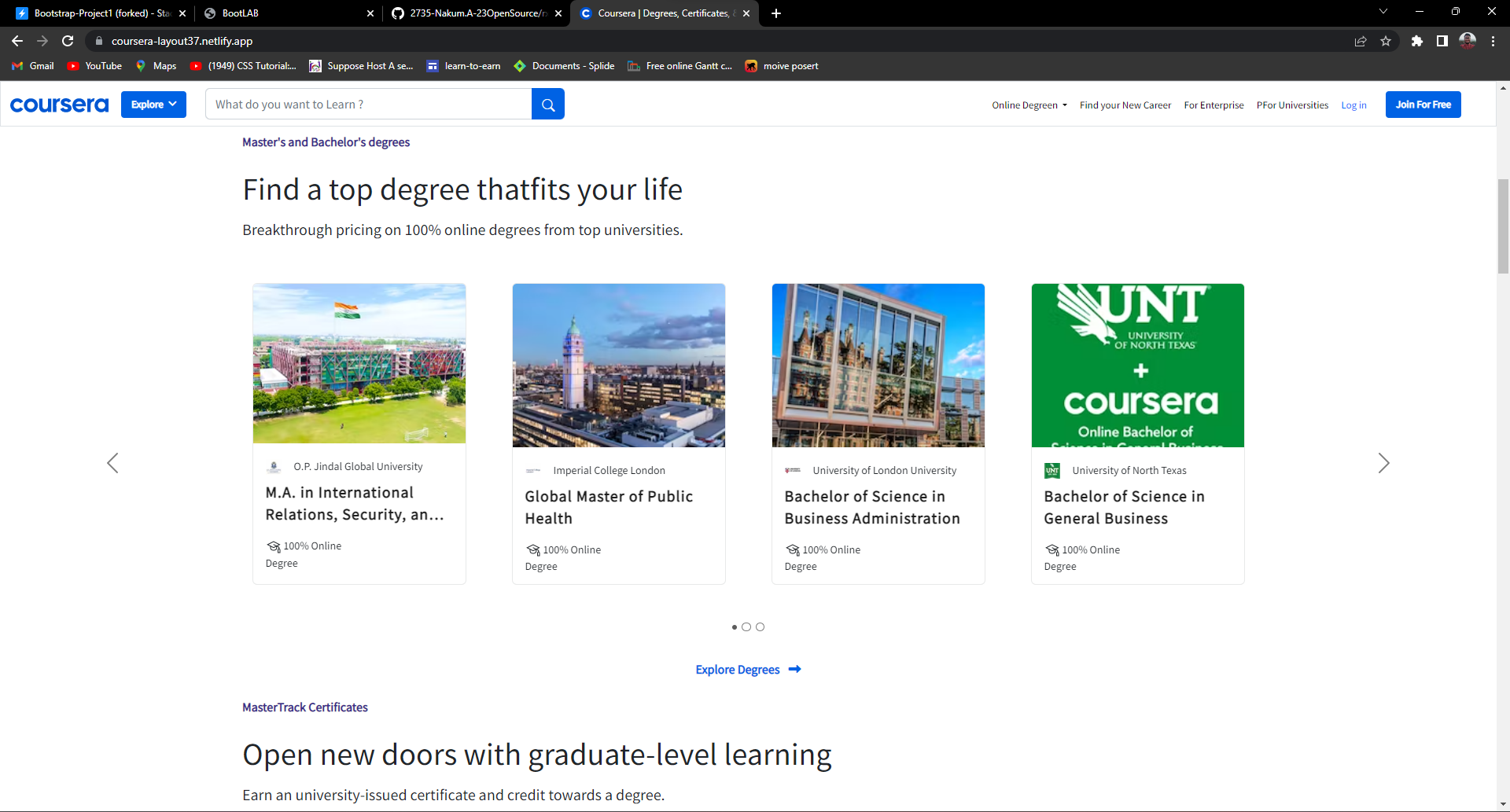
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Figure 12 Bootstrap Assignment-1

**** ****

**Assignment-2**

Hands on the Project what you learn on video tutorial.

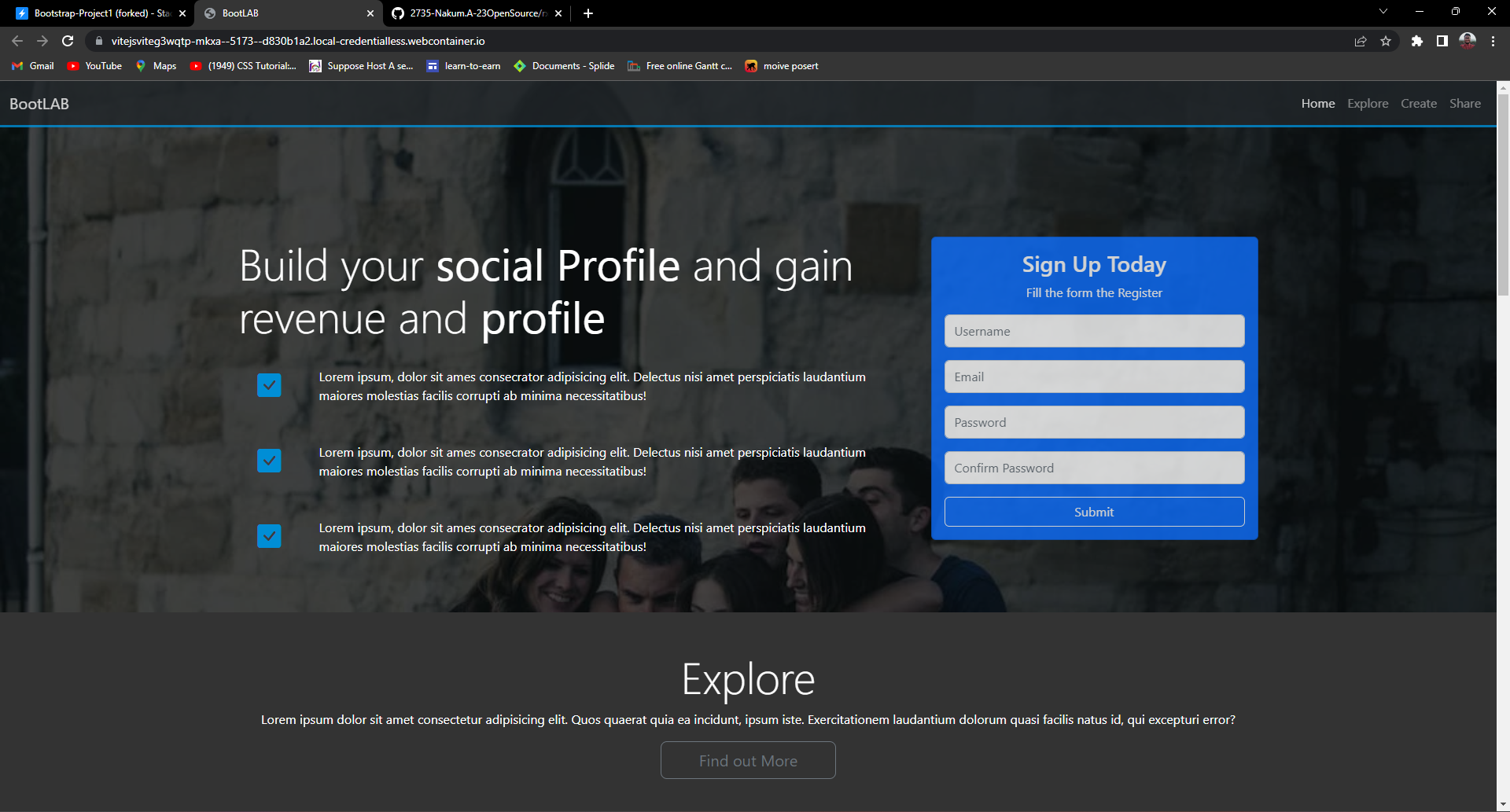


Figure 13 Bootstrap Assignment-2

### **Tailwind: Another CSS Framework**

Tailwind CSS is basically a Utility first CSS framework for building rapid custom UI. It is a highly customizable, low-level CSS framework that gives you all the building blocks that you need. Also, it is a cool way to write inline styling and achieve an awesome interface without writing a single line of your own CSS.

**Feature of Tailwind**

* Highly Customizable.
* Enables building complex responsive layouts
* Responsive and development is easy.
* Components creation is easy.

**How to Include Tailwind CSS?**

By using following methods you can install / include tailwind in your working directory.

* Using Content Delivery Network (CDN)
* Using Node Package Manager (NPM)

Here some disadvantage of CDN is Customize Tailwind’s default theme can’t be used, Directives like @apply, @variants, etc can’t be used and can’t install third-party plugins.

### **Chapter Task**

**Module Name: FT-Tailwind 2.3**

**Day-Task**

**Assignment-1**

Create your own portfolio which should be responsive

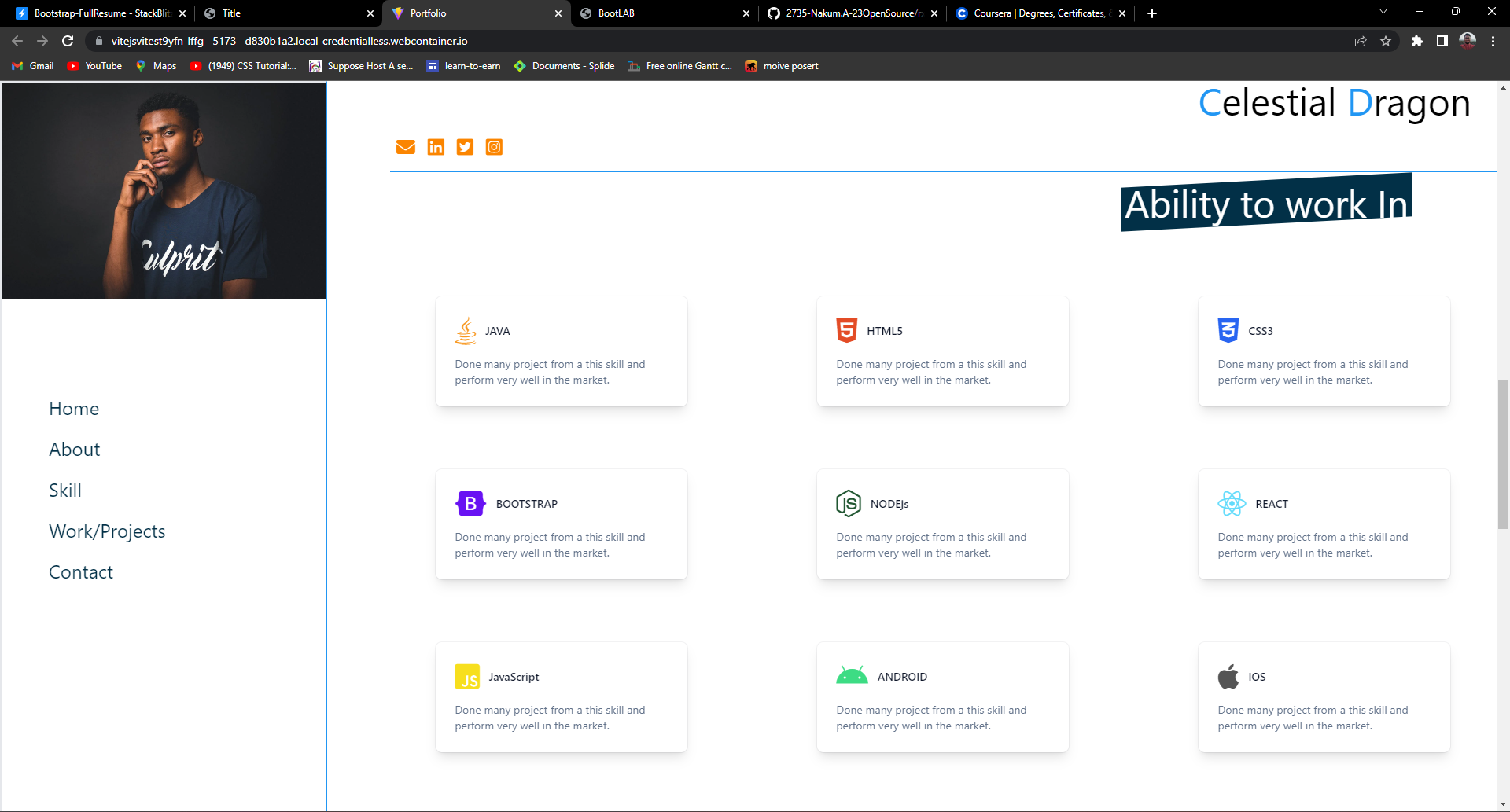


Figure 14 Tailwind Assignment-1

**Assignment-2**

Create the product website

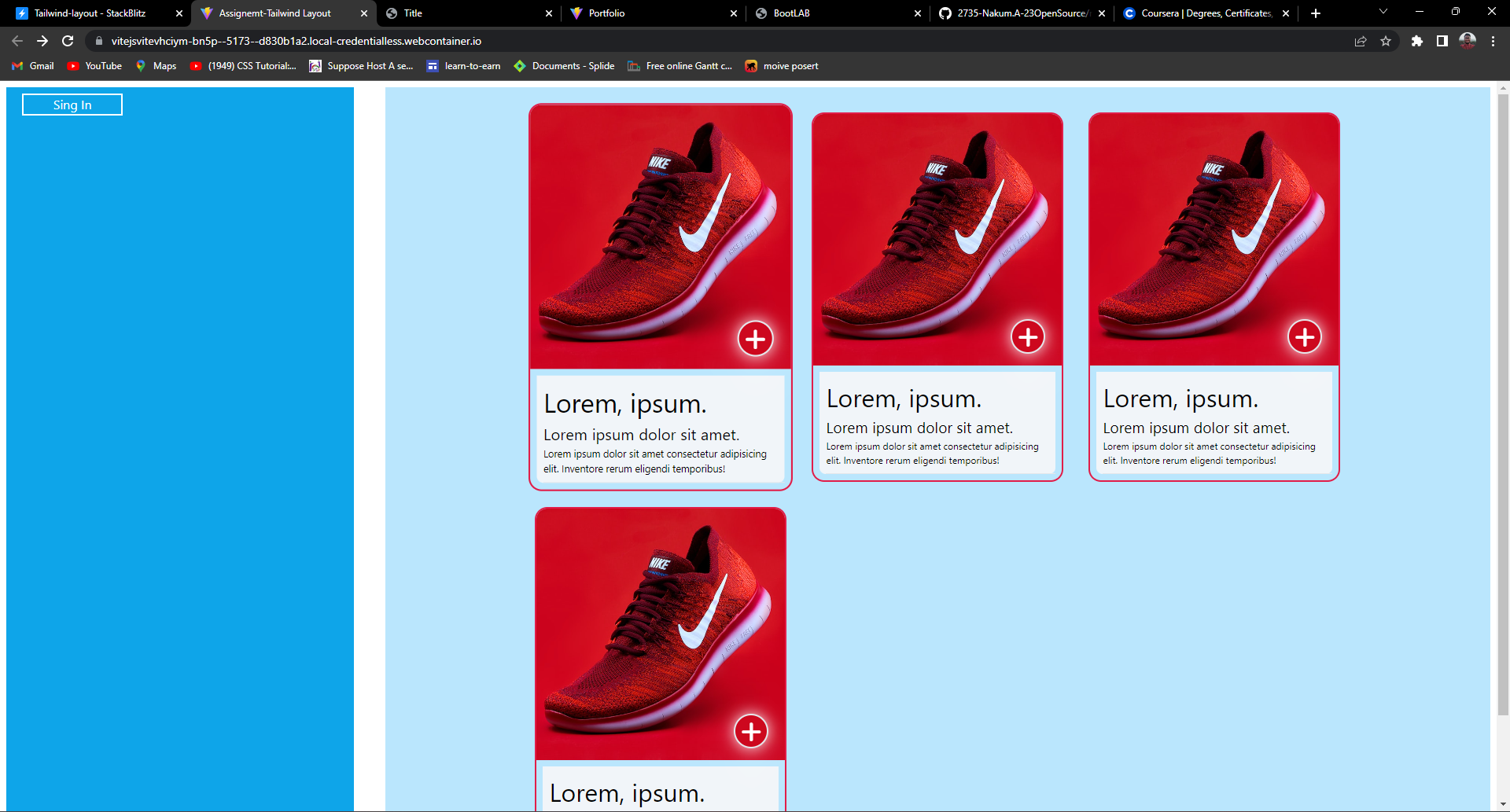


Figure 15 Tailwind Assignment-2

**Assignment-3**

Create the Clone of Web template

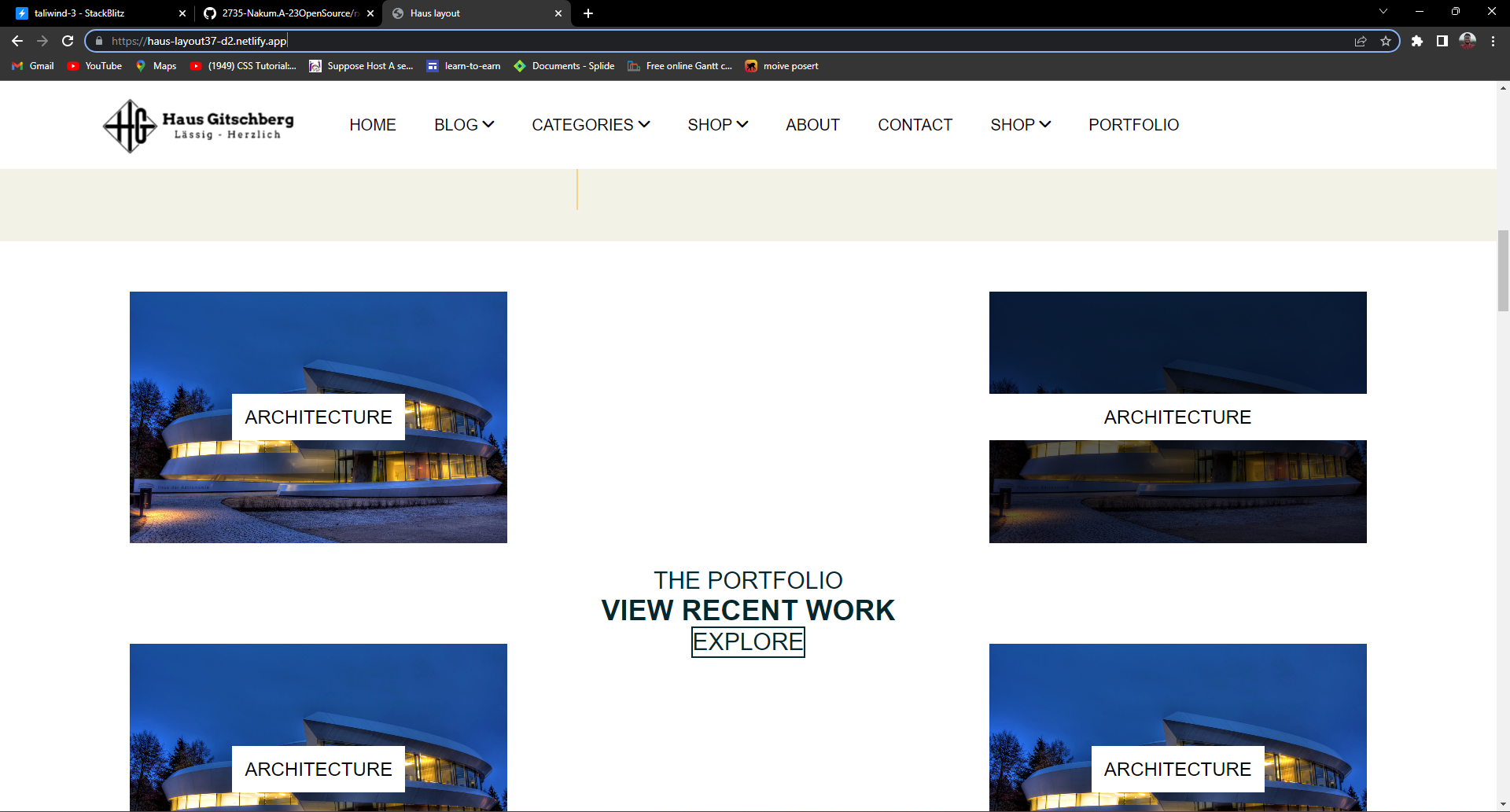


Figure 16 Tailwind Assignment-3

# Chapter 5 – JavaScript

## A web Programming Language

Human body has motion, they can move around. This process called as Dynamicity of anything. Similarly, Nowadays Static website is less popular, so we need to add Dynamicity to the Website. JavaScript can add the Dynamicity in any website.

### **JavaScript**

JavaScript is a lightweight, cross-platform, and interpreted compiled programming language which is also known as the scripting language for webpages. 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 contains a standard library of objects, like Array, Date, and Math, and a core set of language elements like operators, control structures, and statements.

**Feature of JavaScript**

According to a recent survey conducted by Stack Overflow, JavaScript is the most popular language on earth.

With advances in browser technology and JavaScript having moved into the server with Node.js and other frameworks, JavaScript is capable of so much more. Here are a few things that we can do with JavaScript:

* JavaScript was created in the first place for DOM manipulation. Earlier websites were mostly static, after JS was created dynamic Web sites were made.
* Functions in JS are objects. They may have properties and methods just like another object. They can be passed as arguments in other functions.
* Can handle date and time.
* Performs Form Validation although the forms are created using HTML.
* No compiler is needed. It is Work by Browser’s JS Engine.

**Application JS**

* Web Development
* Server Application
* Games
* Machine Learning
* Mobile App

### **Chapter Task**

**Module Name: FT-JavaScript 3.0**

**Day-Task**

**Assignment-1**

Design a form for storing employee details. (EmployeeID, Employee name, age, Gender, designation, salary, location, Email ID, Date of Joining and contact number) Validation required - EmployeeID should be at least 5 character long. use regular Expression - Age should be a number - Each field should contain value - Email ID should be in proper format - Date of joining should be in date format - Location should be in the drop down list - Use radio buttons for Gender.

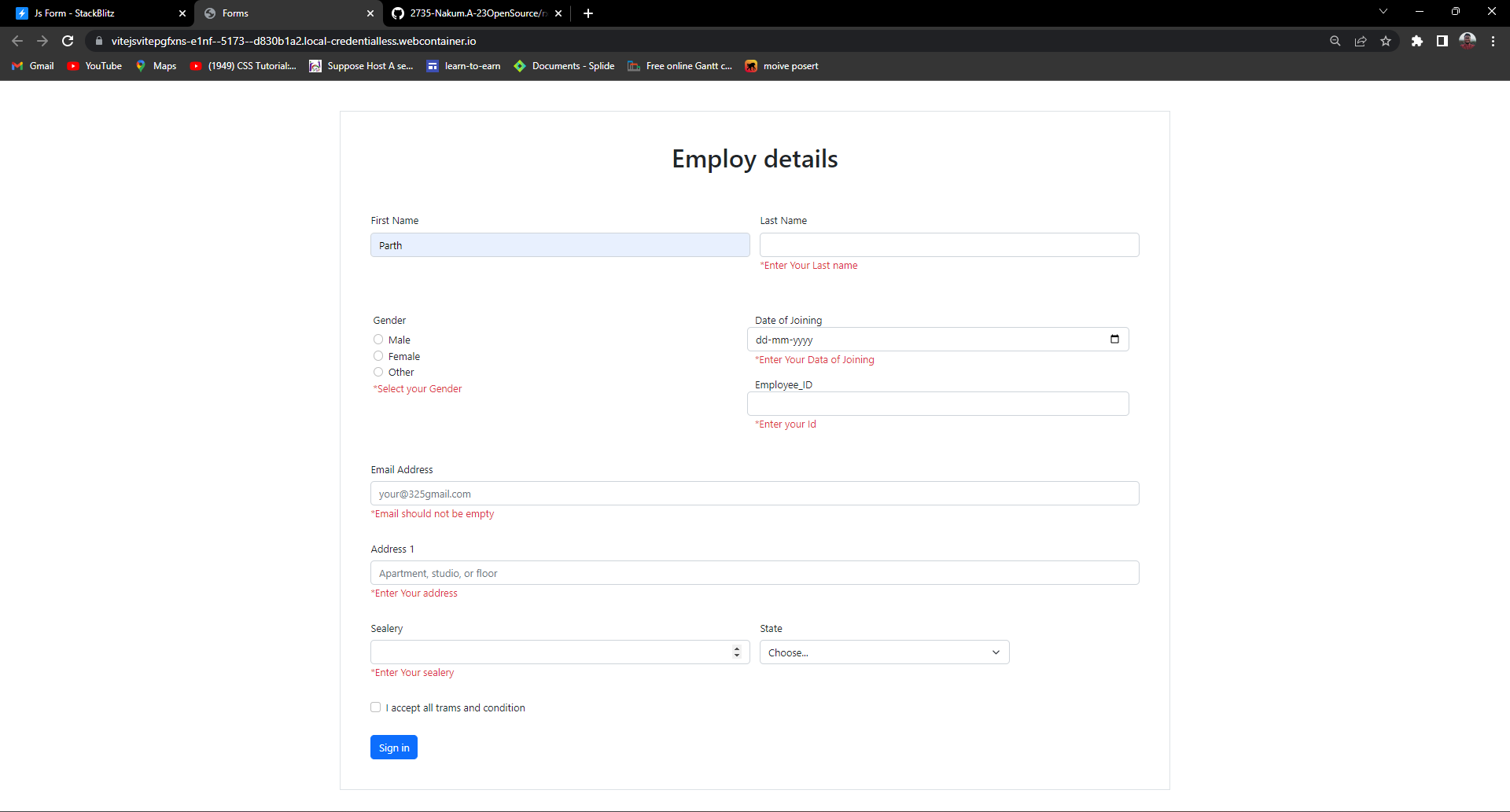


Figure 17 JavaScript Assignment-1

**Assigment-2**

University of Mumbai needs to set an online exam for their students. For that they need to set a timer for three hours. After 3 hours exams should be finished.

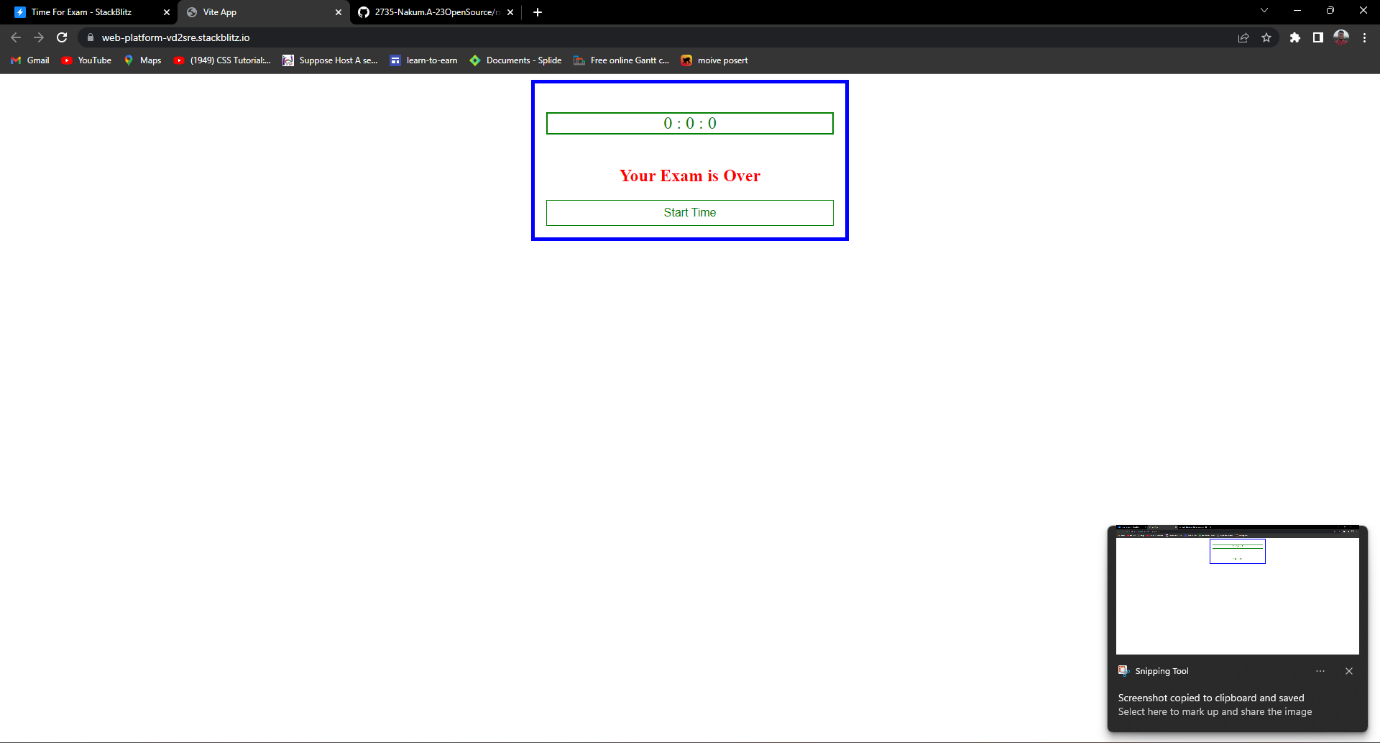
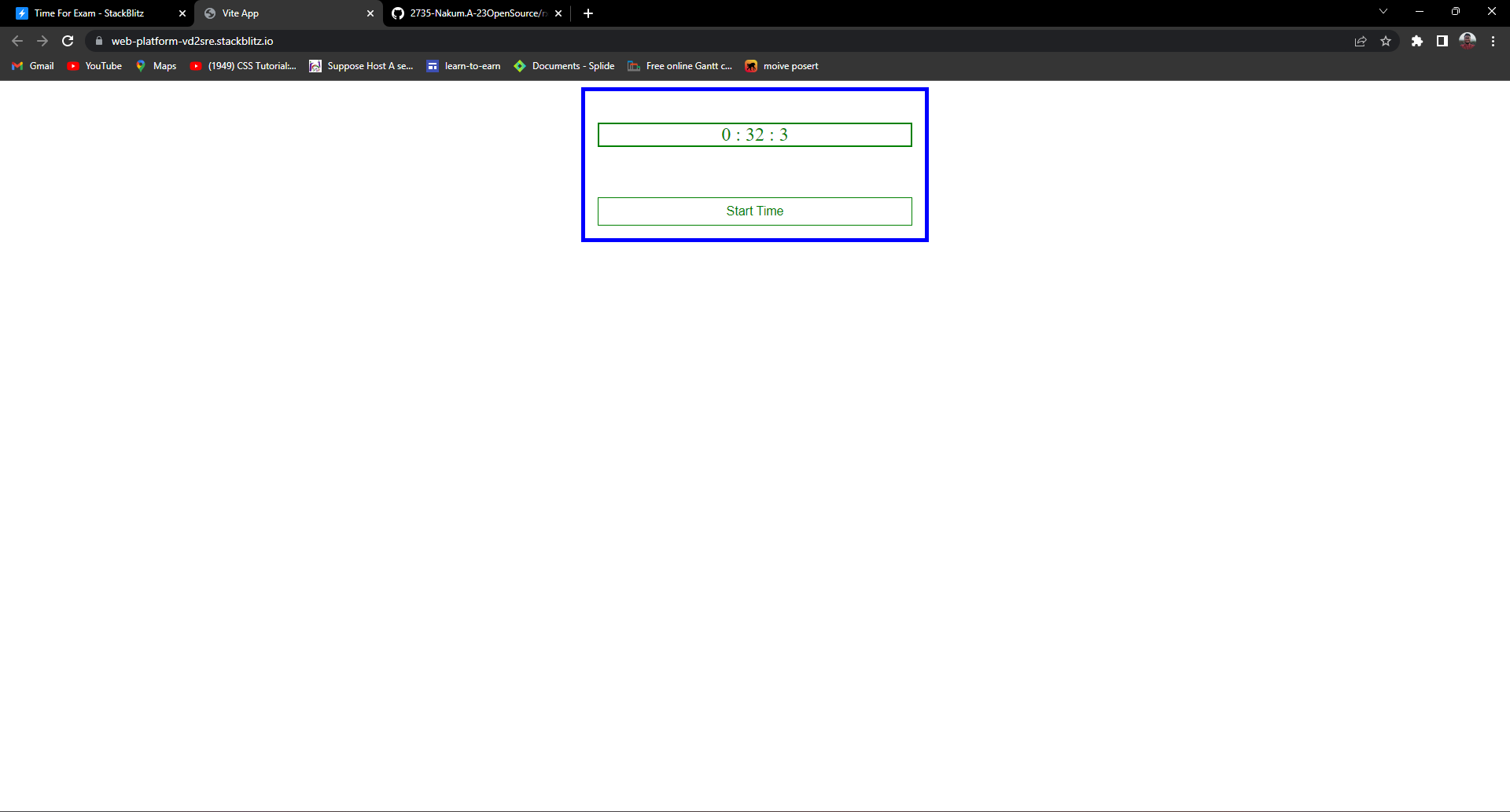
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Figure 18 JavaScript Assignment-2

# Chapter 6 – Docker

## A Development Engine

### **What is Docker?**

Docker is PaaS. This product use the operating system level virtualization to deliver software packages called containers.

*“Docker makes development efficient and predictable”*

Docker is an open-source platform that enables developers to build, deploy, run, update and manage containers —standardized, executable components that combine application source code with the operating system (OS) libraries and dependencies required to run that code in any environment. Containers are lightweight and portable.

Docker takes away repetitive, mundane configuration tasks and is used throughout the development lifecycle for fast, easy, and portable application development – desktop and cloud. With Docker, you can manage your infrastructure in the same ways you manage your applications.

**Terms in Docker**

1. **Docker Container**

Docker Containers contain binaries, libraries, and configuration files along with the application itself.

1. **Docker Image**

It is a file, comprised of multiple layers, used to execute code in a Docker container. They are a set of instructions used to create docker containers.

1. **Docker Engine**

The software that hosts the containers is named Docker Engine. Docker Engine is a client-server-based application

1. **Docker Hub**

Docker Hub is the official online repository where you can find other Docker Images that are available for use. It makes it easy to find, manage, and share container images with others.

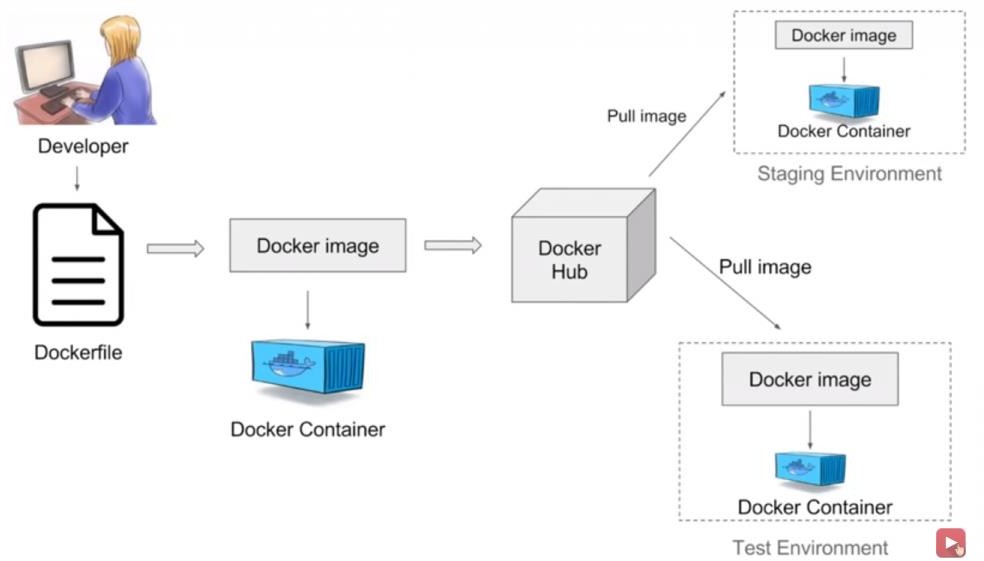


Figure 19 Work Flow of the Docker

### **Chapter Task**

**Module Name: Docker**

**Day-Task**

**Assignment-1**

Deploy your Vite vanilla project of CSS course.

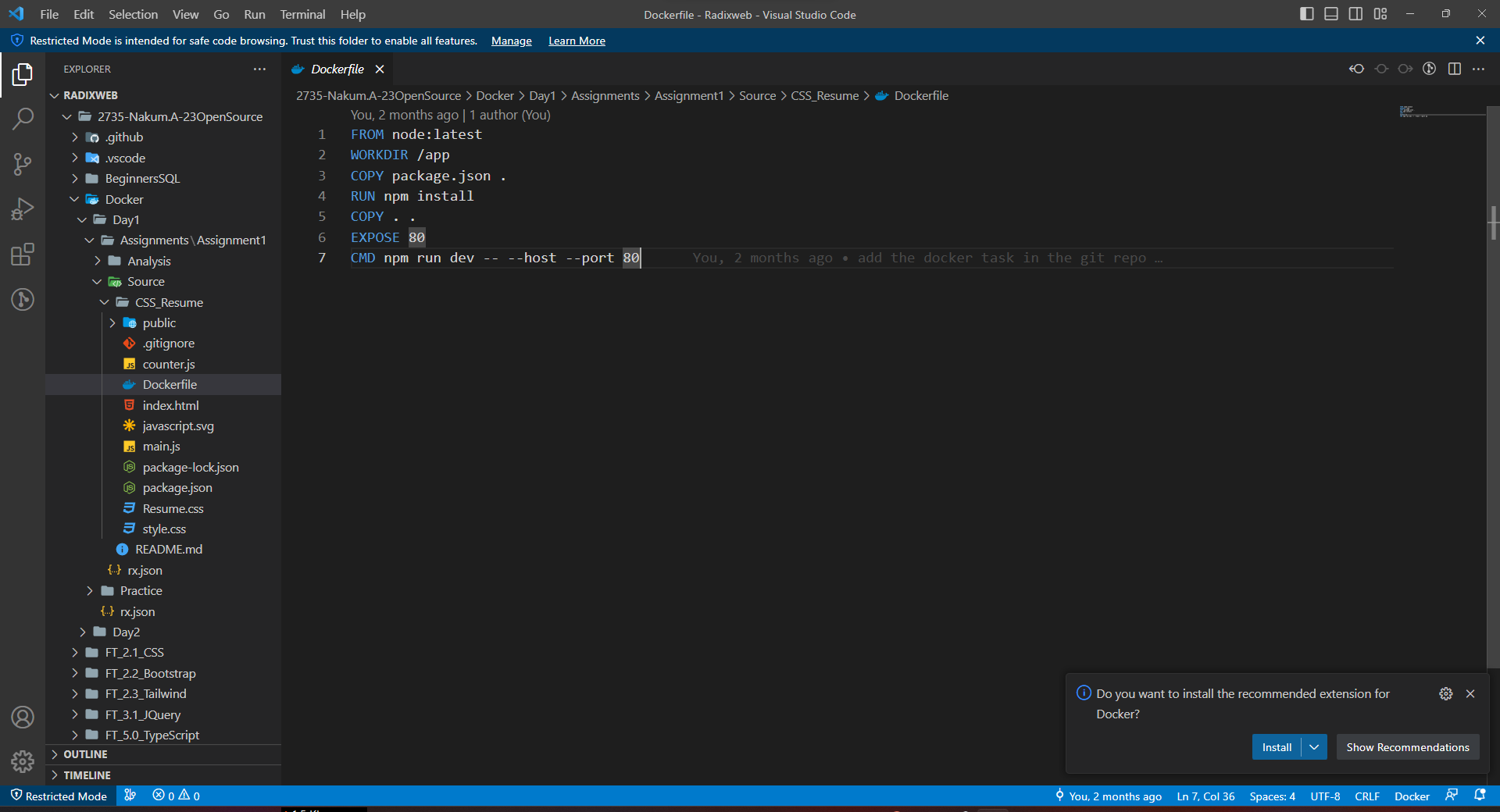
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Figure 20 Docker File

# Chapter 7 – TypeScript

## A JavaScript with OOP’s

**TypeScript**

TypeScript is a free and open-source high-level programming language developed and maintained by Microsoft. It is a strict syntactical superset of JavaScript and adds optional static typing to the language.

TypeScript is designed for the development of large applications and transpires to JavaScript. It was designed by Anders Hejlsberg (designer of C#) at Microsoft. TypeScript being a "Syntactic Superset" means that it shares the same base syntax as JavaScript but adds something to it.

**Typescript vs JavaScript**

* TypeScript is strongly typed, object-oriented, and compiled whereas JavaScript is lightweight and interpreted.
* TypeScript is regarded as a superset of JavaScript.
* TypeScript has a feature known as Static typing but JavaScript does not support this feature.
* TypeScript supports Interfaces but JavaScript does not.
* TypeScript uses concepts like types and interfaces to describe data being used whereas no such concept is available with JavaScript.
* TypeScript supports JS libraries: With TypeScript, developers can use already existing JS libraries.

**Features of TypeScript**

* Object Oriented Programming
* Support Multiple JS Library
* JS is TS
* TS is portable
* DOM Manipulation
* Interface, Templates & Generics like C++.

**Advantage**

* TypeScript always highlights errors at compilation time during the time of development, whereas JavaScript points out errors at the runtime.
* TypeScript supports strongly typed or static typing, whereas this is not in JavaScript.
* TypeScript runs on any browser or JavaScript engine.
* Great tooling supports with IntelliSense, which provides active hints as the code is added.
* It has a namespace concept by defining a module.

**Disadvantages**

* TypeScript takes a long time to compile the code.
* TypeScript does not support abstract classes.
* If we run the TypeScript application in the browser, a compilation step is required to transform TypeScript into JavaScript

### **Chapter Task**

**Module Name: TypeScript**

**Day-Task**

**Assignment-1**

Store 5 employees’ data in one array (ID, FirstName, LastName, Address, Salary). Do the operation searching by index number, EmployeeID, Insert the employee, delete the employee from the Array.

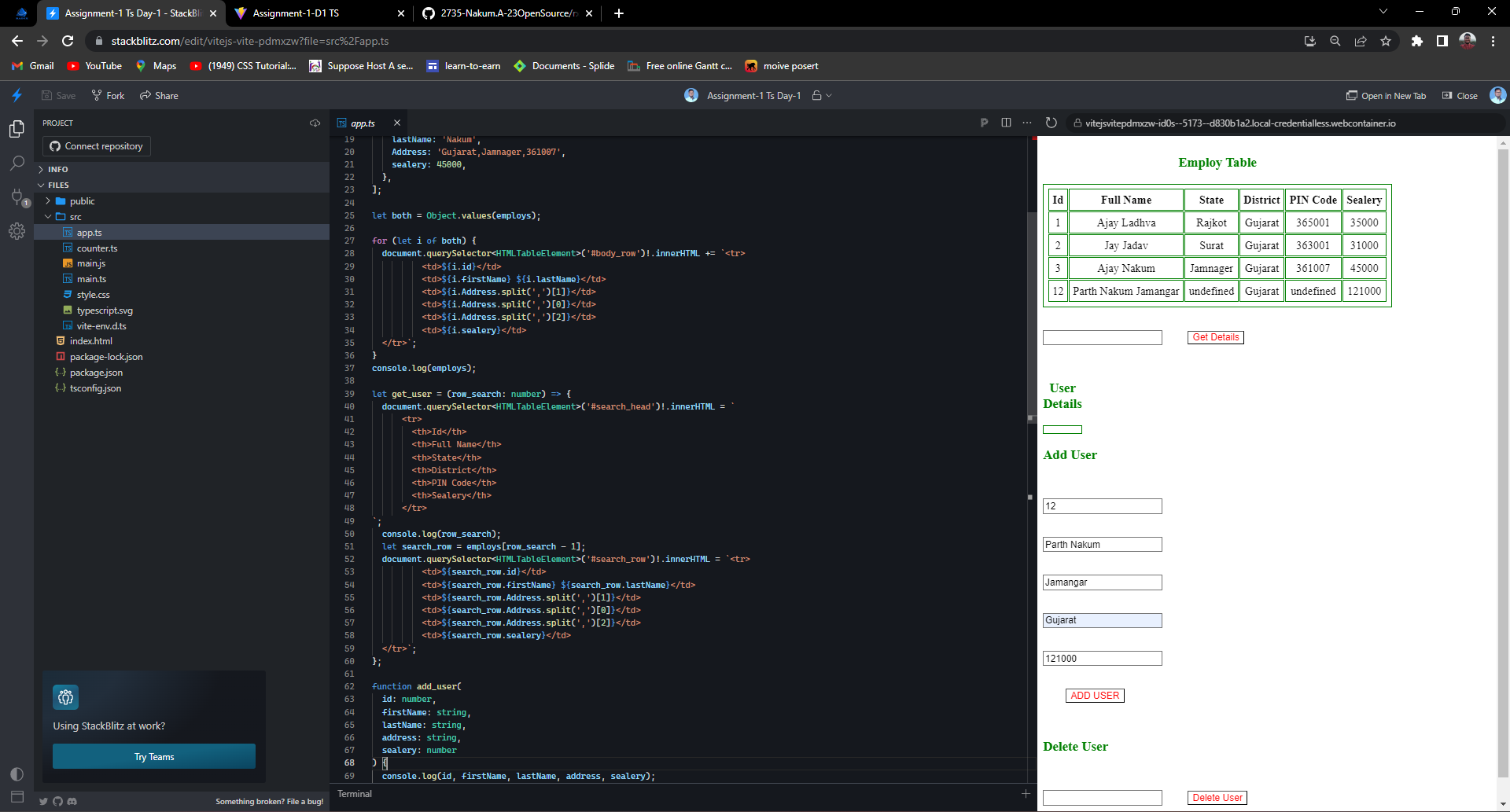


Figure 21 Typescript Assignment-1

**Assignment-2**

There is a retail shop which need to manage the inventory, whenever some purchase is being made product quantity should be reduced, if quanity is less than 5 reorder request should be raised.

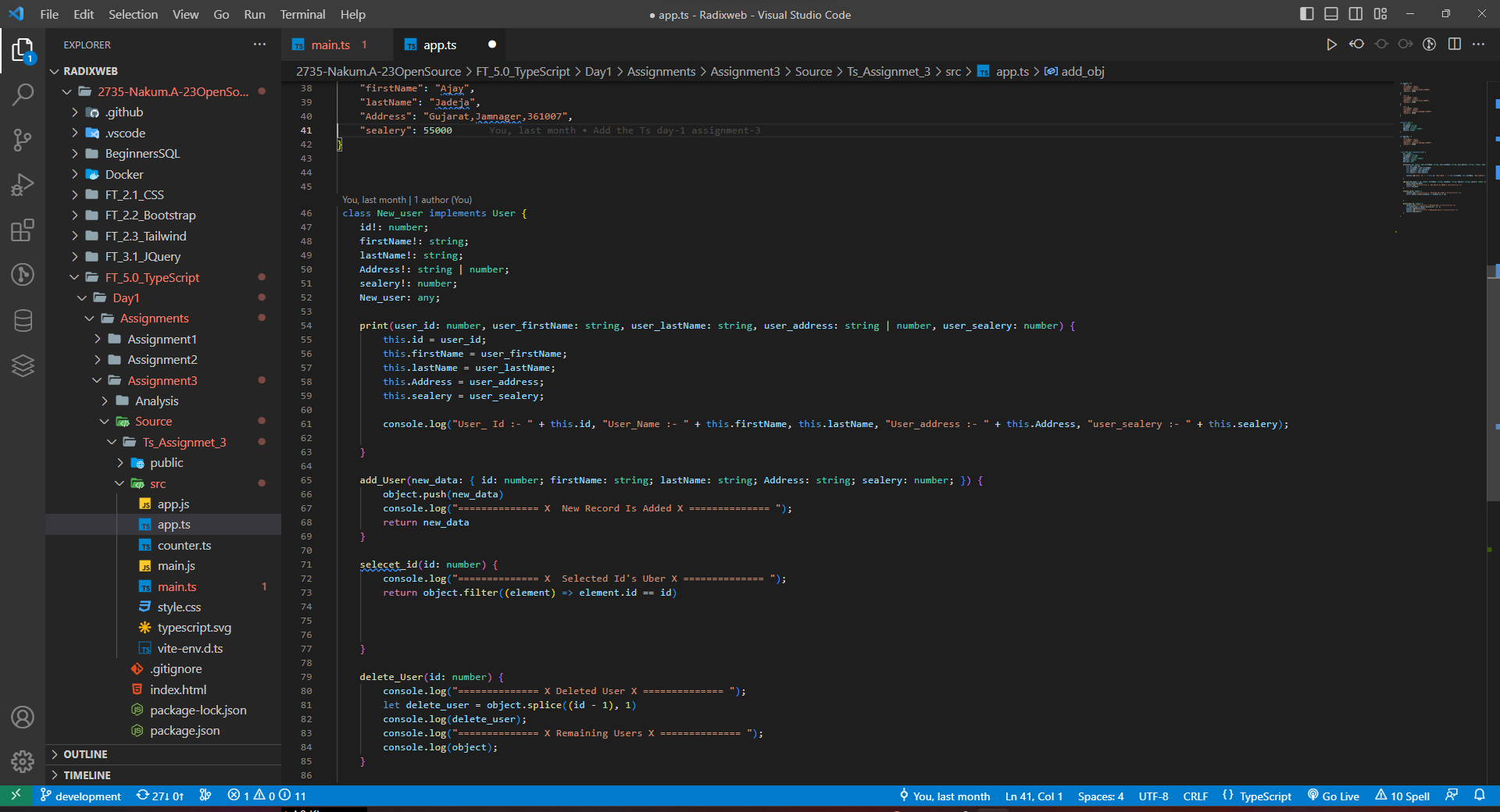


Figure 22 Typescript Assignment-2

**Assignment-3**

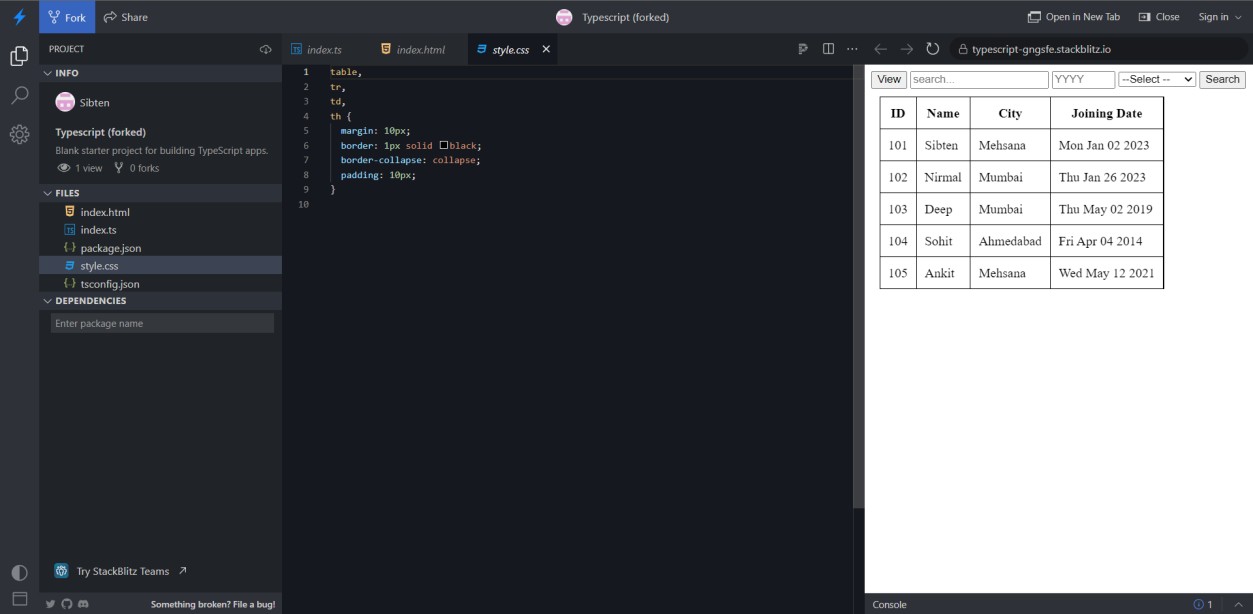
Store 5 Employee Data(ID, Name, City, DOJ) in one Array. Search the employee with ID.

Figure 23 Typescript Assignment-3

# Chapter 8 – SQL

## A Data-Base Management System

**SQL**

SQL stands for Structured Query Language and is a domain-specific

language used in programming and designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS).

SQL is designed for a specific purpose: to query data contained in a relational database. SQL is a set-based, declarative programming language, not an imperative programming language like C or BASIC. However, extensions to Standard SQL add procedural programming language functionality, such as control-of-flow constructs.

SQL consists of many types of statements, which may be informally classed as sublanguages, commonly: a data query language (DQL), [a] a data definition language (DDL), [b] a data control language (DCL), and a data manipulation language (DML).

**Advantages of SQL**

* Faster Query Processing
* No coding skill
* Standardized language
* Portable
* Interactive
* Schemas, DB, Procedure, Functions, Conditional Operator support

**Disadvantages**

* Complex
* High Cost
* Partial Control

### **Chapter Task**

**Module Name: SQL**

**Day-Task**

**Assignment-1**

You have been hired to create a relational database to support a car sales business. You need to store information on the business’s employees, inventory, and completed sales. You also need to account for the fact that each salesperson receives a different percentage of their sales in commission. What tables and columns would you create in your relational database, and how would you link the tables?

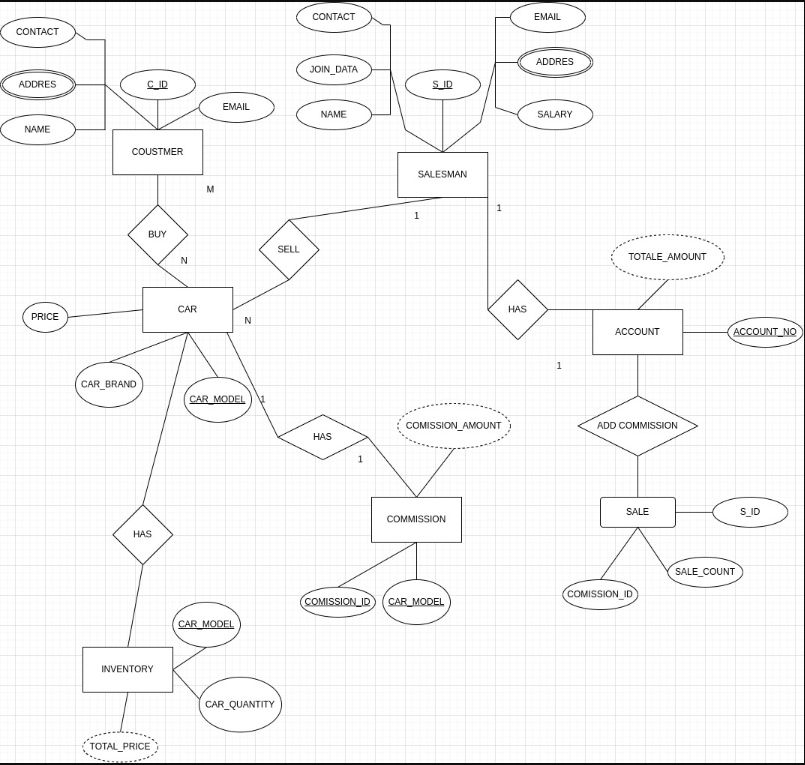
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Figure 24 SQL ER Diagram

**Assignment - 2** (Give the answer of the Queries)

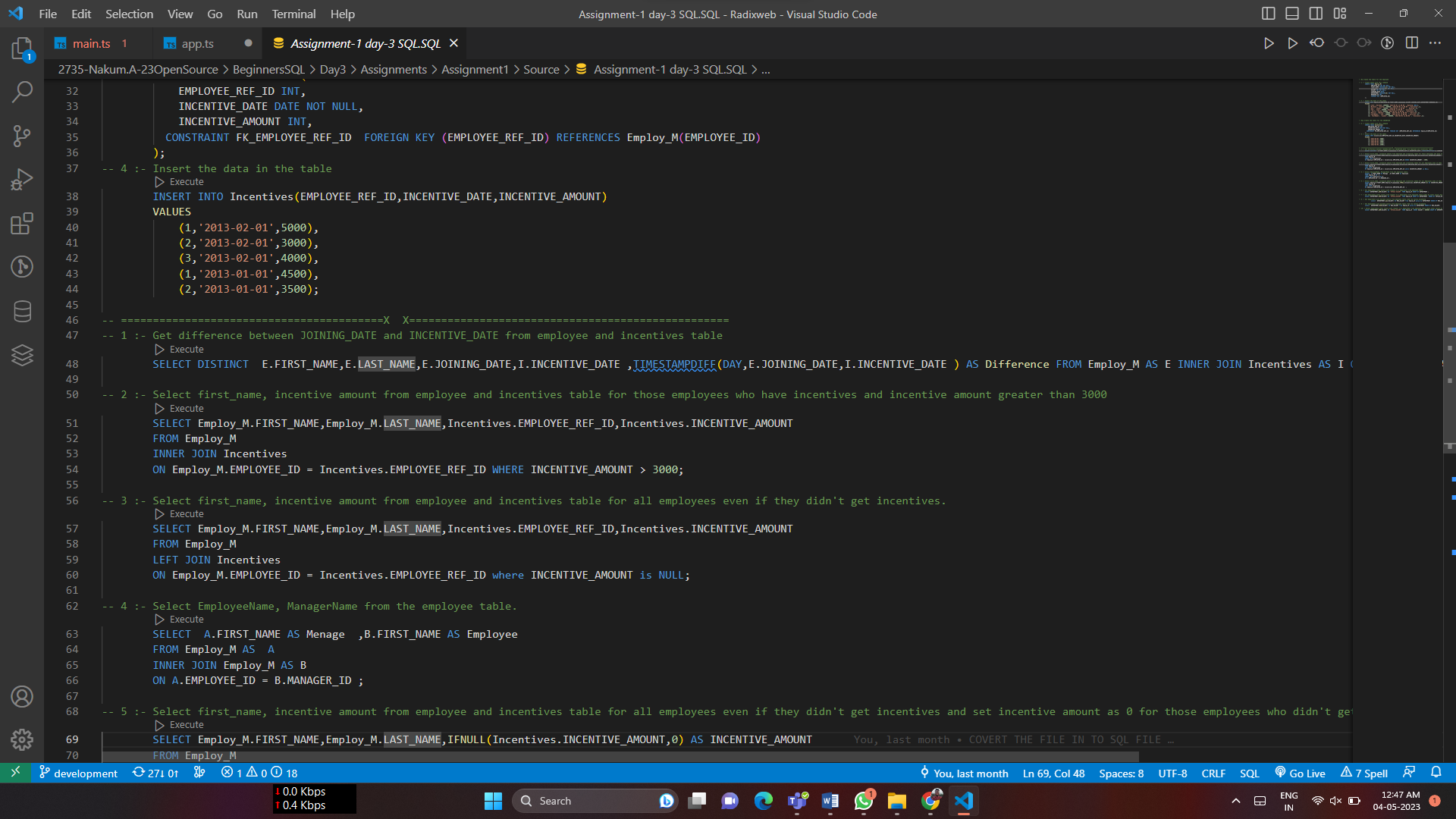
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Figure 25 SQl Assignment-2