**Port Said University**

**Faculty of science**

**Department of Mathematics, Computer science**

Registration System

**Team Work:**

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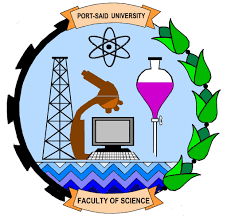
Nada Wael AbdElaziz Helawy

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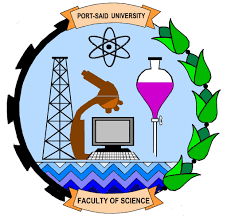
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We hope this project gives all our supervisors and professors as  
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**Chapter 1**

**Introduction**

The System is software to manage all day to day operations for a university.  
 Student registration system is a structure that provides a simple set-up for student enrollment. It is of programs an approach that enables colleges and universities to better supervise a growing number of enrollments, Student Registration System that radically reduces the

Work and costs involved by getting rid of paper

**1.1 Description of the system**

This is an information system developed for the course unit System that radically reduces the work and costs involved by getting rid of paper. Port Said so that it deals with many students’ records specially it their results subject records and their Meta data. The course unit administration is responsible for records and their Meta data. The course unit administration is responsible for x transcript. This system facilitates the information retrieval, analysis of the students’ results and generates a transcript For each student of the faculty.

**1.2 Objectives of the project**

To develop a computer based software system to provide the following for the Course unit administration

1-Provide management information for decision making

2-Provide easy accessible information for all appropriate

3-Provide information that is accurate,secure,consistent,timely and reliable   
 4-Reduce administrative cost  
 5-reduce the paper driven aspects of the existing system

**1.3 Goal**

The system made by user friendly and reduce the burden of users. Our system can be made available le even in the website of our college. Students can easily register the course in our system without any difficulty and can easily understand and also time taken for registration n is less when compared to manual registration. Students can easily register the course in our system without any difficulty and can easily understand and also time taken for registration n is less when compared to manual registration. Options are given to the student to select their elective and also it shows the number of papers available le along with the number of student who have registered and also the number of days for particular elective per semester also displayed at the side

**1.4 Sequence**

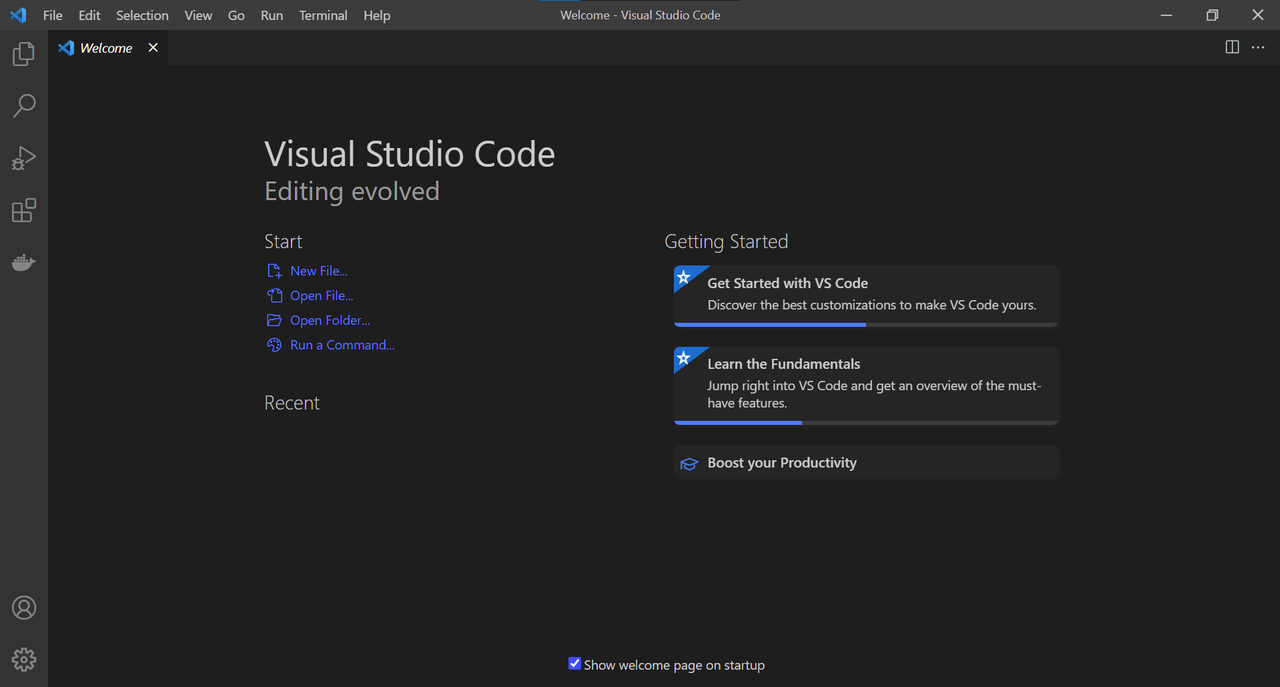
Student login in the system and from id then registration using name and password then move to the page that full the form of the courses

**1.5 Microsoft programs**

Microsoft programs work very efficiently with their own languages, so choosing to work with them was the best option, in addition to providing many additions to help in the work of the project. You do not need to go outside the program to obtain any assistance or additions.

To use it with ease, as will be explained with the following programs.

**1.5.1 Visual Studio Code**

****

**Figure 1.1:Visual Studio code**

**Chapter 2**

**Background**

**2.1HTMLLanguage**HTML stands for Hyper Text Markup Language. HTML depicts the structure of a Web page HTML consists of sequence of elements. Browser know how to display content from HTML elements. Tags represent HTML elements

HTML can include programs written in languages such as JavaScript to modify the behavior and content of web pages; Adding CSS code defines the look and layout of the content. : The definition of the document is of type HTML. Then open tags HTML . Inside tags of HTML contains head and body:

1) Head is the part of properties of html.

2) Body is the structure of the whole site.

**2.1.1HTMLDefinition**HTML is a computer language designed for the creation and development of websites, HTML language becomes a standard , simple and easy to learn uses a series of keywords and signs that lets you control and organize the flow and sequence of all elements that contains a website . HTML is an acronym of ” Hypertext Markup Language ” . A website can be consist of different elements such as images , videos , text , graphics , tables or links , like concrete that holds the bricks with one another to build the structure of our house , HTML

Is the virtual Html concrete through which holds and orders all the elements allowing to show in the web browser this union as a web page

**❖ Tags of head:**

▪ Link: The tag You connect between files such as CSS files, JavaScript, bootstrap, Font awesome and others, and you can also add a logo to the page by using the link.

Example:

<p><a href="https://www.google.com/">Google</a></p>

▪ Meta: The tag defines metadata about an HTML document. Metadata is data (information) about data and is used to specify character set, page description, keywords, author of the document, and viewport settings.

Example:

  <meta name="keywords" content="HTML, CSS, JavaScript">  
  <meta name="author" content="John Doe">

▪ Title: The <title> tag is used to enter a page title

Example:

<title>HTML Elements Reference</title>

❖ Tags of body: In HTML there are some semantic elements that can be used to define different parts of a web page:

<Article> <figure<

<Details> <footer>

<Aside> <header>

|  |
| --- |
|  |
| **Figure 2.1: semantic elements** |

All these tags are found inside the body.

❖ Header: contain navigation bar and image for Website interface.

❖Footer: footer is located at the end of the page and contains the pages of the page and the means of communication for inquiries, as well as the company that created the site and in what year it was established.

There are also many Semantic Elements that we will learn about in the project.

We have many tags that are also used inside the semantics element, but these tags are called non-semantics elements:

▪Headings can range from <h1> to <h6>

▪<table>: Allow web developers to arrange data into rows and columns.

▪<tr>: Each table row starts with a <tr> and end </ tr> with tag.

▪<td> : Each table cell is defined by a <td> and a </td> tag. Everything between <td> and </td> are the content of the table cell.

▪ <th>: sometimes you want your cells to be headers, in those cases use the <th> tag instead of the <\th> tag

**And more you can learn from:**

[**https://www.w3schools.com/html/default.asp**](https://www.w3schools.com/html/default.asp)

**2.1.2Advantages of HTML**

HTML is a standard and global language can be interpreted and executed by any computer, smartphone , tablet or electronic device with processing capacity regardless of the operating system that it uses , HTML runs on Windows , Mac , Linux , iOS or Android , being a great advantage over other languages that are interpreted and designed only for certain operating systems HTML can be described as a simple and intuitive language that does not require computer skills to use, as markup language knowledge of a few labels and rules are sufficient to create and maintain a multitude of webpages, HTML is a clear and simple language easy to use. HTML is a language that can be written and compiled in any text editor, avoiding the acquisition and installation of specific software programs or as in other languages through which it is written and the code is compiled. With just open our Notepad on Windows or Text Edit on Mac we can write our HTML code and compile it on any browser like Chrome, Mozilla, Safari, or Microsoft Edge

**2.2CSSLanguage**CSS Stands for Cascading Style Sheet. CSS is used to format the layout of Web pages. They can be used to define text styles, table sizes, and other aspects of Web pages that earlier could only be defined in a page’s HTML.

CSS helps Web developers design a uniform look across several pages of a Web site. Instead of defining the style of each table and each block of text within a page’s HTML, usually used styles need to be defined only once in a CSS document once the cascading style sheet defines the style, any page that references the CSS file can use it. Plus, CSS makes it easy to change styles across several pages at once. For example, a Web developer may want to increase the default text size from 10pt to 12pt for fifty pages of a Web site. If the pages all reference the same style sheet, the text size only needs to be changed on the style sheet and all the pages will show the larger text

|  |
| --- |
|  |
| **Figure 2.2:site without CSS** |

|  |
| --- |
|  |
| **Figure 2.3: Site with CSS** |

|  |
| --- |
|  |
| **Figure 2.4:Site without CSS** |

|  |
| --- |
|  |
| **Figure 2.5: Site with CSS** |

**2.2.1 Where to call CSS:**

* External CSS:

Example: <link rel="style sheet" href="mystyle.css">

* Internal CSS:

Example :

<Style>

Background-color: linen;

{

Color: maroon;

Margin-left: 40px;

}

</style>

* Inline CSS :

Example:

style="color :blue ;text -align: center;">

style="color :red;">This is a paragraph.

**2.2.2 CSS Syntax:**

|  |
| --- |
|  |
| **Figure 2.6: Syntax of CSS** |

The Selector points to the HTML element you want to style. The declaration block contains one or more declarations separated by semicolons. Each declaration includes a CSS property name and a value, separated by a colon. Multiple CSS declarations are separated with semicolons, and declaration blocks are surrounded by curly braces.

**2.2.3 CSS property:**

In CSS we will find many properties that help control the aesthetics of the site, such as:

\* Color \* Background \* Margin.

\*Border \* Transition \* Font.

\* Position \*Width \* Height

\* Display. \* padding \* Animation.

And more you can learn from: <https://www.w3schools.com/css/default.asp>

**2.2.4 Advantages of CSS :**

CSS has many advantages and benefits. Following are some major advantages associated with using it:

**• Easy maintenance**: CSS changes the traditional method of setting style and layout on each individual web page by allows CSS designers to use

a single file to control the style and layout of multiple web pages in the website

**• Fast Webpage loading**: The ability to edit any number of HTML pages at one time by editing a single Style Sheet file will reduce the file size, bandwidth usage and the pages will load faster

**• Search engine optimization benefits**: Change the appearance of an entire website by editing one style sheet that confirms that your web pages have consistent styling through- out your website

**• Absolute Positioning**: It allows you to put a layer on a specific place on your screen so that it stays the same no matter what screen resolution or browser window sizes a viewer uses

**• Browser Compatibility**: CSS develops the characteristic of your website while securing your visitors with the capacity to view your website as precisely as you have designed it to be

**2.3 JavaScript language**

JavaScript is a lightweight scripting programming language that is used to make web pages interactive, also it is can calculate, confirm, and manipulate the data. It can insert dynamic Text into HTML and CSS.

JavaScript is a computer programming language for the web . It is most commonly used as a part of web pages , the JavaScript implementations allow client - side script to interact with the user and make dynamic pages . It is an interpreted programming language with object - oriented capabilities

**2.3.1 Data type:**

In JavaScript there is different kind of data type:

1. String data type
2. Number (Integer) data type
3. Boolean data type
4. Object data type.
5. Undefined data type.
6. Array data type.
7. Function data type.

1. **String Data Type**:

The string data type is used to represent textual data, Strings are created using single or double quotes surrounding one or more characters, As shown in the

Following figure :

|  |
| --- |
|  |
| **Figure 2.7: String Data Type:** |

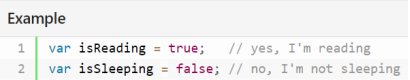
1. **The Number Data Type:**

The number data type is used to represent positive or negative numbers with or without decimal place, or numbers written using exponential notation

|  |
| --- |
|  |
| **Figure 2.8: Number Data Type** |

**3. Boolean Data type:**

The Boolean data type can hold only two values: true or false. It is typically used to store values like yes (true) or no (false), on (true) or off (false), etc. as demonstrated in the following figure:



**Figure 2.9: Boolean Data type**

**4.The Undefined Data Type:**

The undefined data type can only have one value-the special value undefined. If a variable has been declared, but has not been assigned a value, has the value undefined.



**Figure 2.10:The Undefined Data Type**

**5. The Object Data Type:**

The object is a complex data type that allows you to store collections of data. An object contains properties, defined as a key-value pair. A property key (name) is always a string, but the value can be any data type, like strings, numbers, Booleans, or complex data types like arrays, function and other objects. You'll learn more about objects in upcoming chapters.



**Figure 2.11: The Object Data Type**

**6. The Array Data Type:**

An array is a type of object used for storing multiple values in single variable. Each value (also called an element) in an array has a numeric position, known as its index, and it may contain data of any data type-numbers, strings, Booleans, functions, objects, and even other arrays.

The array index starts from 0, so that the first array element is arr[0] not arr[1].



**Figure 2.12: The Array Data Type**

**7. The Function Data Type:**

The function is callable object that executes a block of code. Since functions are objects, so it is possible to assign them to variables, as shown in the following example

|  |
| --- |
| **Figure 2.13:The Function Data Type** |

**2.3.2 Object Type:**

In JavaScript there is different type of Objects:

1 .Object.

2 .Date.

3 .Array

4 .String (if defined with new key word).

5 .Number (if defined with new key word).

6 .Boolean (if defined with new key word).

7 .Math.

8 .Regular expressions.

9. Function.

**2.3.3 Conditions:**

**1.If Statement:**

Use the if statement to specify a block of JavaScript code to be executed if a condition is true. Use the else statement to specify a block of code to be executed if the condition is false

**2.Switch Statement:**

Use the switch statement to select one of many code blocks to be executed.

**2.3.4 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

**• 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** : JavaScript is used to include such items as drag and drop components and sliders to give a Rich Interface to your site  
  
**• Immediate feedback to the visitors** : They don’t have to wait for a page reload to see if they have forgotten to enter something

**2.3.5 Uses of JavaScript**

JavaScript is on of the most used language in the market these days . The most important of them :-  
  
**•web development**

**•Web Servers**

**•Games and Art**

**•Web and Server Application**

**•Smart watch and Mobile Application**

**•Flying Robots**

**2.3.6 What can JavaScript do?**  
This section contains some examples of what JavaScript can do:  
JavaScript can change HTML content  
JavaScript can change HTML styles(CSS)  
JavaScript can change HTML attribute Values  
JavaScript can show and hide HTML Elements

**2.4 Sass Language**

Sass is an extension of cascading style sheets (CSS), the language used to define the layout and formatting of HTML documents. It uses fully-compatible CSS syntax, but provides additional features like CSS variables and nested rules that make CSS more efficient and easier to edit. Sass is the most mature, stable, and powerful professional grade CSS extension language in the world

• Sass stands for Syntactically Awesome Style sheet  
• Sass Is an extension to CSS  
• Sass is a CSS pre-processor  
• Sass is completely compatible with all versions of CSS  
• Sass reduces repetition of CSS and therefore saves time  
• Sass was designed by Hampton Catlin and developed by Natalie Weizenbaum in 2006  
• Sass is free to download and use

**2.4.1 Sass function:**

1- String 2-Numeric 3-list 4-map 5-selector 6-colo

7-introspection

**1-Sass String Functions :**

The string functions are used to manipulate and get information about strings. Sass strings are 1-based. The first character in a string is at index 1, not 0.

# 2- Sass Numeric Functions:

# The numeric functions are used to manipulate numeric values.

## **3- Sass List Functions:**

The list functions are used to access values in a list, combine lists, and add items to lists.

Sass lists are immutable (they cannot change). So, the list functions that return a list, will return a new list, and not change the original list.

Sass lists are 1-based. The first list item in a list is at index 1, not 0.

## **4-** **Sass Map Functions**

In Sass, the map data type represents one or more key/value pairs.

**Tip:** It is also possible to use the [List functions](https://www.w3schools.com/sass/sass_functions_list.php) from the previous page, with maps. Then the map will be treated as a list with two elements.

Sass maps are immutable (they cannot change). So, the map functions that return a map, will return a new map, and not change the original map.

# 5- Sass Selector Functions

# The selector functions are used to check and manipulate selectors.

## **6- Sass Introspection Functions**

The introspection functions are rarely used when building a style sheet. However, they are valuable if something does not work properly - to figure out what's going on: like debugging functions.

# 7- Sass Color Functions

We have divided the color functions in Sass into three parts: Set color functions, Get color functions, and Manipulate color functions

**2.4.2 Advantages of Sass**  
• Sass facilitates you to write clean, easy and less CSS in a programming construct  
• It contains fewer codes so you can write CSS quicker  
• It is more stable, powerful, and elegant because it is an extension of CSS. So, it is easy for designers and developers to work more efficiently quickly.  
• It is compatible with all versions of CSS . So , you can use any available CSS libraries.  
• It provides nesting so you can use nested syntax and useful functions like color manipulation , math functions and other values.

**2.4.3 Disadvantages of Sass**•The developer must have enough time to learn new features present in this preprocessor before using it.  
•Using Sass may cause losing benefits of the browser’s built in element inspector.  
•Code has to be compiled  
•Difficult Troubleshooting

**2.4.4 Why use Sass?**  
If it takes time and effort to learn Sass, why bother if you can do the same thing with CSS? There are a few major reasons why developers find learning Sass to be a worthwhile investment

**2.5 MYSQL Language**

MySQL stands for Structured Query Language . It is the standard language used to interact with the database . MySQL is a database management system that helps to manipulate database stored in different tables in the computer .the relation database systems

( RDBMS ) provides much better performance for data routing through desktop database programs

**2.5.1 MySQL Features**

**•Relational Database Management System (RDBMS):**

MySQL is a relational database management system

**•Easy to use**: MySQL is easy to use . You have to get only the basic knowledge of SQL. You can build and interact with MySQL with only a few simple SQL statements

**•It is secure**: MySQL consist of a solid data security layer that protects sensitive data from intruders . Passwords are encrypted in MySQL  
  
**•Client / Server Architecture:** MySQL follows this architecture . There is a MySQL database server and many clients ( application programs ) arbitrarily communicating with the server by querying data , saving changes ... etc. MySQL  
is free to use and you can download it from its official website

**• Allows roll - back** : MySQL allows transactions to be rolled back , commit and crash recovery  
  
•**High Performance** : MySQL is faster , more reliable and cheaper because of its unique storage engine architecture

•**High Flexibility**: MySQL supports a large number of embedded applications which makes MySQL very flexible

•**High Productivity**: MySQL uses Triggers , Stored procedures and views which allows the developer to give a higher productivity

**2.6 Node.js**

**2.6.1Defination on Node.js**

Node.js is a server-side platform wrapped around the JavaScript language for building scalable, event-driven applications. This is confusing for even experienced programmers because the traditional JavaScript environment has always been client side in a user’s browser or in an application that is talking to a server. JavaScript has not been considered when it comes to the server responding to client requests, but that is exactly what Node.js provides. Node.js is not written in JavaScript (it is written in C++) but it uses the JavaScript language as an interpretive language for server-side request/response processing. In other words Node.js runs stand-alone JavaScript programs

**2.6.2Features of Node.JS**

•**Easy Node.js** is quite easy to start with. It’s a go-to choice for web development beginners. With a lot of tutorials and a large community—getting started is very easy.

•**Scalable** :It provides vast scalability for applications. Node.js, being single threaded, is capable of handling a huge number of simultaneous connections with high throughput.

•**Speed** : Non-blocking thread execution makes Node.js even faster and more efficient.

•**Packages:** A vast set of open-source Node.js packages is available that can simplify your work. There are more than one million packages in the NPM ecosystem today.

•**Strong backend:** Node.js is written in C and C++, which makes it speedy and adds features like networking support.  
  
•**Multi-platform** Cross-platform support allows you to create SaaS websites, desktop apps, and even mobile apps, all using Node.js

•**Maintainable** Node.js is an easy choice for developers since both the frontend and backend can be managed with JavaScript as a single language.

**2.6.3 Advantages of Node.JS**

•**Easy Scalability**: Developers prefer to use Node.js because it is easily scaling the application in both horizontal and vertical directions. We can also add extra resources during the scalability of the application.

**•Real-time web apps**: If you are building a web app you can also use PHP, and it will take the same amount of time when you use Node.js, But if I am talking about building chat apps or gaming apps Node.js is much more preferable because of faster synchronization. Also, the event loop avoids HTTP overloaded for Node.js development.

**•Fast Suite**: NodeJs runs on the V8 engine developed by Google. Event loop in NodeJs handles all asynchronous operation so NodeJs acts like a fast suite and all the operations can be done quickly like reading network connection or file system.

**•Easy to learn and code**: NodeJs is easy to learn and code because it uses JavaScript. If you are a front-end developer and have a good grasp of JavaScript you can easily learn and build the application on NodeJS

**•Advantage of Caching**: It provides the caching of a single module. Whenever there is any request for the first module, it gets cached in the

Application memory so you don’t need to re-execute the code

•**Data Streaming**: In NodeJs HTTP request and response are considered as two separate events. They are data stream so when you process a file at the time of loading it will reduce the overall time and will make it faster when the data is presented in the form of transmissions. It also allows you to stream audio and video files at lightning speed.

•**Hosting**: PaaS (Platform as a Service) and Heroku are the  
 hosting platforms for NodeJS application deployment which is easy to use without facing any issue.

•**Corporate Support**: Most of the well-known companies like Walmart, Paypal, Microsoft, Yahoo are using NodeJS for building the applications. NodeJS uses JavaScript, so most of the companies are combining front-end and backend Teams together into a single unit.

**2.6.4 Application of NodeJS**

•**Real-time chats**—Due to its single-threaded asynchronous nature, Node.js is well-suited to processing real-time communication.

•**Internet of Things**—IoT applications usually comprise multiple sensors, as they frequently send small chunks of data that can pile into a large number of requests. Node.js is a good choice since it’s able to handle these concurrent requests quickly.

•**Data streaming**—Companies like Netflix use Node.js for streaming purposes. This is mainly due to Node.js being lightweight and fast, besides which Node.js provides a native streaming API. These streams allow users to pipe requests to  
each other, resulting in data being streamed directly to its final destination.  
  
•**Complex single-page applications (SPAs)—**In SPAs, the whole application is loaded in a single page. This usually means there are a couple of requests made in the background for specific components.

**2.7 Express.js**

Express.js is a free and open-source web application framework for Node.js. It is used for designing and building web applications quickly and easily. Web applications are web apps that you can run on a web browser. Since Express.js only requires javascript, it becomes easier for programmers and developers to build web applications and API without any effort.Express.js is a framework of Node.js which means that most of the code is already written for programmers to work with. You can build a single page, multi-page, or hybrid web applications using Express.js. Ex press.js is lightweight and helps to organize web applications on the server-side into a more organized MVC architecture. It is important to learn javascript and HTML to be able to use Express.js. Express.js makes it easier to manage web applications . lt is a part of a javascript based technology called MEAN software stack which stands

For Mongo DB, Express Js, AngularJS, and Node.js.

Express.js is the backend part of MEAN and manages routing. sessions, HTTP requests, error handling, etc. The JavaScript library of Express.js helps the programmers to build efficient and fast web apps. Express.js  
enhances the functionality of the node js. In fact. if you don’t use Express.js, then you have to do a lot of complex programming to build an efficient API. It has made programming in node.js effortless and has given many additional features.

**2.7.1 Advantages of Express.js**

* Makes Node.js web application development fast and easy.
* Easy to configure and customize.
* Allows you to define routes of your application based on HTTP methods and URLs.
* Includes various middleware modules which you can use to perform additional tasks on request and response.
* Easy to integrate with different template engines like Jade, Vash, EJS etc.
* Allows you to define an error handling middleware.
* Easy to serve static files and resources of your application.
* Allows you to create REST API server.
* Easy to connect with databases such as MongoDB, Redis, MySQL

## **Disadvantages of Express.js:**

Although Express.js is a very convenient and easy to use framework, it has some minor drawbacks that may influence the development process. Before starting the development with Node.js or Express.js think about the scale and complexity of the project. Here are the main underlying potential problems you may face and some ways to avoid them.

* Event-driven nature (callbacks)
* Philosophy of plugins known as middleware
* Code organization

**Chapter 3**

**DataBase**

The database is divided into several tables, such as the table of all student data, the student account storage table which includes its password (encrypted in the database), email and finally the table that control transfer of data and this is the basis of the difference of this project. This table is intended to collect student data and format it in an Excel file so that it is finally explained to the student and to the administration. The entire database was designed with (PostgreSQL) The following includes an explanation of tables with simple examples of code.

**3.1 First Table**

The purpose of this table is to follow up with the student in the event of any technical failure on the site during registration. The table stores the error that occurred in the database and presents it to the developer at the site maintenance date. The site instead of the user sending reports about the site or what went wrong

|  |
| --- |
|  |
| **Figure 3.1: First Table** |

**3.2 Second table**

This table is responsible for storing users’ data (user name, email, password) and this data is received and stored in the table by registering on the website .

When logging in, the user’s email and password that was previously saved in this table are verified, and the password verification process is done by decrypting it from the database in order to increase the security rate on the site, and the password is decrypted through the back-end code

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| --- |
|  |
| **Figure 3.2: Second Table** |

**3.3 Third Table**

This table contains all student data such as the student’s full name, student number, e-mail, student status, academic year and the student’s registered courses From this table, the student’s data is recalled and stored in a formatted excel file and sent to the administration

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| --- |
|  |
| **Figure 3.3:Third Table** |

**3.4 E-R Diagram**

The following figure shows the mechanism of the previous tables’ work and their connection to each other, and the contents and function of each table in a simplified manner

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|  |

|  |
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| **Figure 3.4:E-R diagram** |

**Chapter 4**

**BackEnd**

**4.1 SELECT query without where condition in postgreSQL**

**4.1.1 What is PostgreSQL?**

PostgreSQL is an advanced, enterprise-class, and open-source relational database system. PostgreSQL supports both SQL (relational) and JSON (non-relational) querying.

PostgreSQL is a highly stable database backed by more than 20 years of development by the open-source community.

PostgreSQL is used as a primary database for many web applications as well as mobile and analytics applications.

PostgreSQL support most popular programming languages:

Python

Java

C#

C/C+

Ruby

JavaScript (Node.js)

Perl

Go

Tcl

PostgreSQL feature highlights

PostgreSQL has many advanced features that other enterprise-class database management systems offer, such as:

User-defined types

Table inheritance

Sophisticated locking mechanism

Foreign key referential integrity

Views, rules, subquery

Nested transactions (savepoints)

Multi-version concurrency control (MVCC)

Asynchronous replication

The recent versions of PostgreSQL support the following features:

Native Microsoft Windows Server version

Table spaces

Point-in-time recovery

And more new features are added in each new release.

PostgreSQL is designed to be extensible. PostgreSQL allows you to define your own data types, index types, functional languages, etc.

If you don’t like any part of the system, you can always develop a custom plugin to enhance it to meet your requirements e.g., adding a new optimize

**4.1.2 History of PostgreSQL**

The PostgreSQL project started in 1986 at Berkeley Computer Science Department, University of California.

The project was originally named POSTGRES, in reference to the older Ingres database which also developed at Berkeley. The goal of the POSTGRES project was to add the minimal features needed to support multiple data types.

In 1996, the POSTGRES project was renamed to PostgreSQL to clearly illustrate its support for SQL. Today, PostgreSQL is commonly abbreviated as Postgres.

Since then, the PostgreSQL Global Development Group, a dedicated community of contributor continues to make the releases of the open-source and free database project.

Originally, PostgreSQL was designed to run on UNIX-like platforms. And then, PostgreSQL was evolved run on various platforms such as Windows, macOS, and Solaris.

**4.1.3 How do I write SQL query in PostgreSQL**

1-CREATE TABLE query in PostgreSQL. CREATE TABLE is a keyword that will create a new, initially empty table in the database.

2-INSERT query in PostgreSQL.

3-SELECT query without WHERE condition in PostgreSQL.

**4.1.4 Connect to PostgreSQL database server using psql**

Psql is an interactive terminal program provided by PostgreSQL. It allows you to interact with the PostgreSQL database server such as executing SQL statements and managing database objects.

First, launch the psql program and connect to the PostgreSQL Database Server using the postgres user

|  |
| --- |
|  |
| **Figure 4.1 : launch the psql program** |

Second, enter all the information such as Server, Database, Port, Username, and Password. If you press Enter, the program will use the default value specified in the square bracket [ ] and move the cursor to the new line. For example, localhost is the default database server. In the step for entering the password for user postgres, you need to enter the password the user postgres that you chose during the PostgreSQL installation.

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| --- |
|  |
| **Figure 4.2: enter all the information** |

Third, interact with the PostgreSQL Database Server by issuing an SQL statement. The following statement returns the current version of PostgreSQL

|  |
| --- |
| **Figure 4.3 : interact with the PostgreSQL Database Server** |

**4.2 Student module**

**4.2.1 What is partitioning in database?**

Partitioning is powerful functionality that allows tables, indexes, and index-organized tables to be subdivided into smaller pieces, enabling these database objects to be managed and accessed at a finer level of granularity

Partitioning is the database process where very large tables are divided into multiple smaller parts. By splitting a large table into smaller, individual tables, queries that access only a fraction of the data can run faster because there is less data to scan. The main of goal of partitioning is to aid in maintenance of large tables and to reduce the overall response time to read and load data for particular SQL operations.

**Vertical Partitioning on SQL Server tables**

Vertical table partitioning is mostly used to increase SQL Server performance especially in cases where a query retrieves all columns from a table that contains a number of very wide text or BLOB columns. In this case to reduce access times the BLOB columns can be split to its own table. Another example is to restrict access to sensitive data e.g. passwords, student information etc. Vertical partitioning splits a table into two or more tables containing different columns.

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|  |
| **Figure 4.4:Vertical Partitioning on SQL Server tables** |

**An example of vertical partitioning**

An example for vertical partitioning can be a large table with reports for student containing basic information, such as report name, id, number of report and a large column with report description. Assuming that ~(95 percent)t of users are searching on the part of the report name, number, etc. and that only (5 percent) of requests are opening the reports description field and looking to the description. Let’s assume that all those searches will lead to the clustered index scans and since the index scan reads all rows in the table the cost of the query is proportional to the total number of rows in the table and our goal is to minimize the number of IO operations and reduce the cost of the search.

Example on the Employee Reports table.

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| --- | --- | --- |
| |  |  | | --- | --- | | **Figure 4.5:Employee Reports table** |  | |
|  |

If we run a SQL query to pull Report ID, Report Name, Report Number data from the Employee Reports table the result set that a scan count is 5 and represents a number of times that the table was accessed during the query, and that we had 113,288 logical reads that represent the total number of page accesses needed to process the query

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | **Figure 4.6:the total number of page accesses needed to process the query** |  | |
|  |

As indicated, every page is read from the data cache, whether or not it was necessary to bring that page from disk into the cache for any given read. To reduce the cost of the query we will change the SQL Server database schema and split the Employee Reports table vertically.

This is a picture of the reality of the project code

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | **Figure 4.7: reality of project code** |  | |

**4.2.2 How to UPDATE from a SELECT statement in SQL Server**

An UPDATE query is used to change an existing row or rows in the database. UPDATE queries can change all tables’ rows, or we can limit the update statement affects for certain rows with the help of the WHERE clause. Mostly, we use constant values to change the data, such as the following structures.

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| --- |
| **Figure 4.8: The full update statement is used to change the whole table sdata with the same value** |

The conditional update statement is used to change the data that satisfies the WHERE condition.

|  |
| --- |
|  |
| **Figure 4.9: The conditional update statement is used to change the data that satisfies the where condition** |

However, for different scenarios, this constant value usage type cannot be enough for us, and we need to use other tables’ data in order to update our table. This type of update statement is a bit complicated than the usual structures. In the following sections, we will learn how to write this type of update query with different methods, but at first, we have to prepare our sample data.

**Preparing the sample data**

With the help of the following query, we will create Persons and AddressList tables and populate them with some synthetic data. These two tables have a relationship through the PersonId column, meaning that, in these two tables, the PersonId column value represents the same person.

|  |
| --- |
| **Figure 4.10: Preparing the sample data** |

UPDATE from SELECT: Join Method

In this method, the table to be updated will be joined with the reference (secondary) table that contains new row values. So that, we can access the matched data of the reference table based on the specified join type. Lastly, the columns to be updated can be matched with referenced columns and the update process changes these column values.

In the following example, we will update the Person CityName and Person Postcode columns data with the City and Postcode columns data of the AdressList table.

|  |
| --- |
|  |
| **Figure 4.11: UPDATE from SELECT: Join Method** |

We typed the table name, which will be updated after the UPDATE statement. After the SET keyword, we specified the column names to be updated, and also, we matched them with the referenced table columns. After the FROM clause, we retyped the table name, which will be updated. After the INNER JOIN clause, we specified the referenced table and joined it to the table to be updated. In addition to this, we can specify a WHERE clause and filter any columns of the referenced or updated table. We can also rewrite the query by using aliases for tables.

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| --- |
|  |
| **Figure 4.12: rewrite the query** |

**Performance Tip:**

Indexes are very helpful database objects to improve query performance in SQL Server. Particularly, if we are working on the performance of the update query, we should take into account of this probability. The following execution plan illustrates an execution plan of the previous query. The only difference is that this query updated the 3.000.000 rows of the Persons table. This query was completed within 68 seconds.

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | **Figure 4.13: Performance Tip** |  | |

**What is the process for connecting a backend with an SQL database?**

In order to connect your backend with SQL database you need to know few details:

**Q. What is the hostname?**

A. A hostname is the address of the server where SQL database is installed, which can be local host if installed in your local machine or can be any server address where SQL is hosted.

**Q. What is username and password?**

A. If locally installed then username is root and password is mostly blank but if in any server then use the credential provided by admin.

**Q. Database name?**

A. You also need to provide database name, which you are going to use in you application. If no database is present, you should create one.

**Q. Backend programming language?**

A. Connector/Driver vary for each programming language, before proceeding with connection you to download the driver and use that driver with the below query string to connect with database.

Once you get all the information your connection string will look like this: sql://username:password@localhost/databasename (it may vary a little bit depending upon your backend programming language).

|  |
| --- |
| Queries SQL By using postgresql  **Figure 4.14: An image of the project code for )Queries SQL By using PostgreSQL(** |

The back end is designed using the JS language. The back end is divided into the controlling elements of the site, the rules for registering on the site, logging into the site, conditions during use, and finally linking the back end to the database to allow the site to access student data, and the most important part is Export the student’s complete data in an excel file

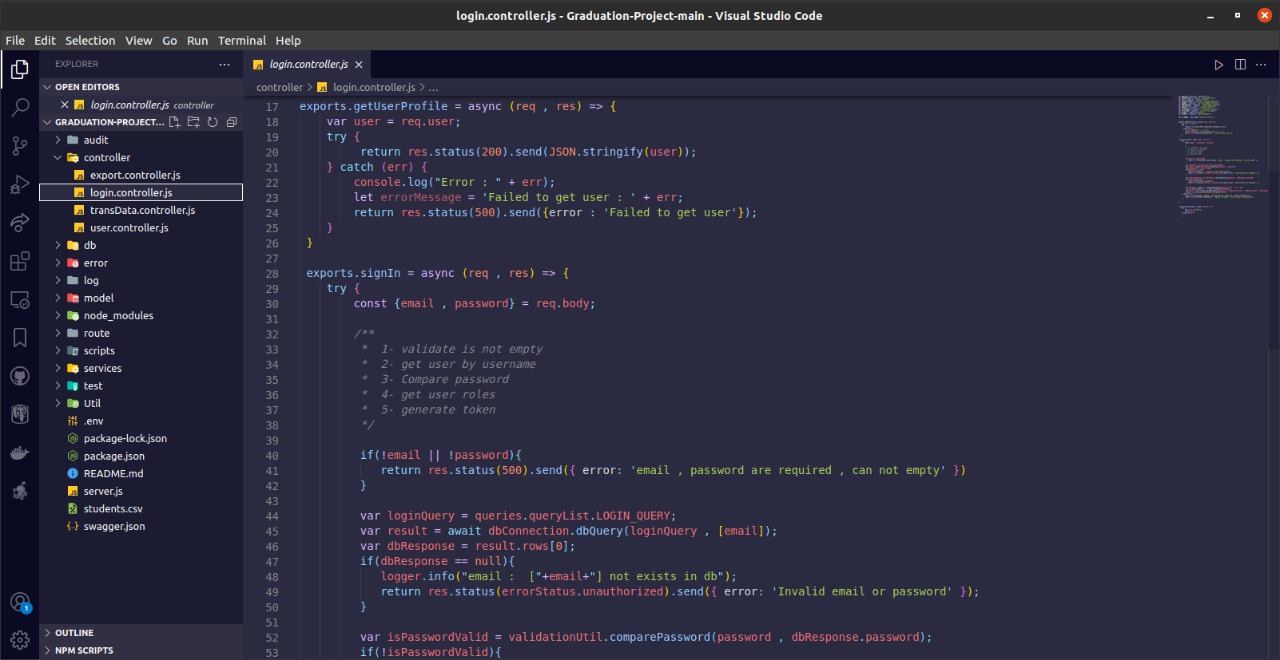
**4.3 controllers  
4.3.1 Export Controller**

This code is designed and used to collect and convert students’ data into an Excel file by linking the code to the website’s database so that the previously recorded or recent student data is called (such as academic level, number of hours, study materials, cumulative average ... etc.) This becomes clear In the following picture.

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | **Figure 4.15: Export Controller** |  | |
|  |

**4.3.2 Login Controller**

This code has several functions, which is to ensure that the fields that must be filled in are not empty. In the case of creating a password, it will be necessary to write the password of this code, saving the user mail with the name of the user that will be entered in the account creation step Make sure that the registration conditions are complete, the e-mail that the student uses to register does not already exist, and finally make sure that the user is not a robot. The following image shows part of the code.

****

**Figure 4.16: Login Controller**

**5.3.3 Trans Data controller**

Its purpose is when the student finishes registering his courses for the next semester, his data is transferred and saved in the database by linking the database to the back end, including updating the student’s status in the success and failure courses.

This code contains some conditions, which are the user name, name The student is complete, the title, the courses, the academic year...etc. (all of them are shown in the following image of the code) that must be filled out, and in the event that there is a condition that is not met, the site will not complete the registration The following image shows part of the code.

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| --- |
|  |
| **Figure 4.17: Trans Data controller** |

**5.3.4 User controller**

In the case of logging in for any student, its purpose is to verify the user name and password by calling them from the database and decrypting the password

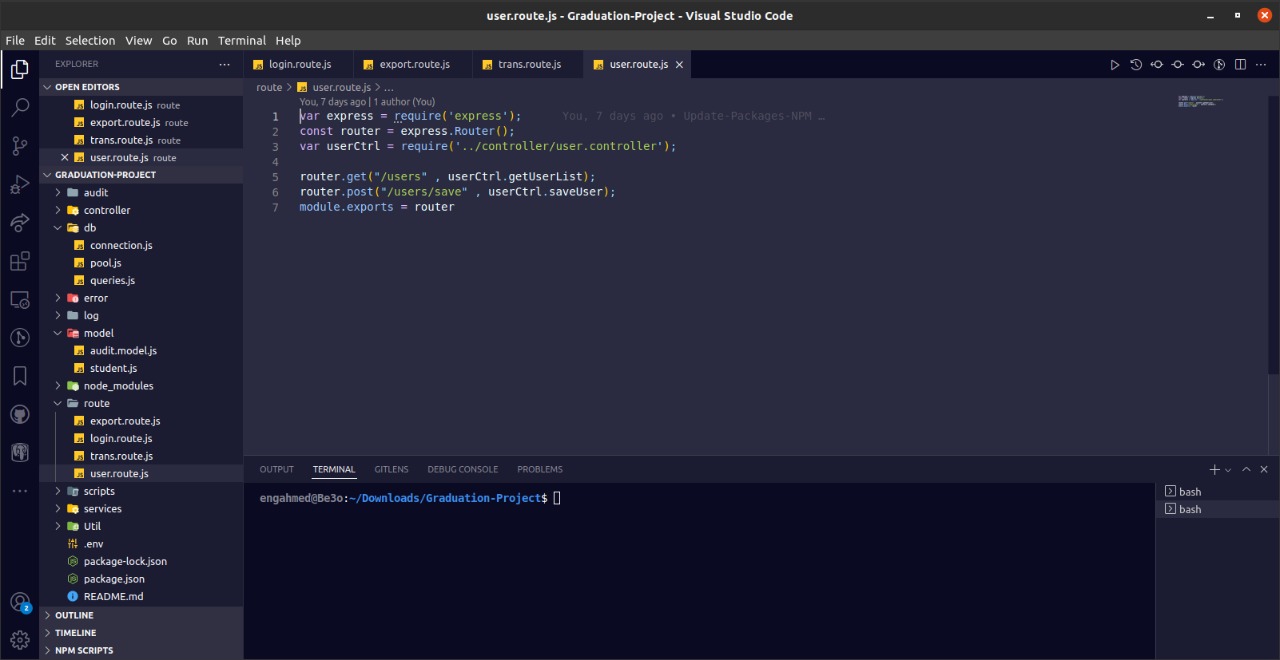
|  |
| --- |
|  |
| **Figure 4.18: User controller** |

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**Figure 4.19: User controller**

**4.4 The direction of storing data in the database.**

The following code shows the data received from the user and its way to storage in the database.



**Figure 4.20: The direction of storing data in the database.**

**4.5 Data Verification.**

When there is a login process, the site verifies the correctness of the user name and the password used, whether it is correct and matches the ones in the database or it has an error and does not match the existing data.

|  |
| --- |
| Validation password & Emails from Database  **Figure 4.21: Data Verification** |

**4.6 Server Configuration.**

Server maintenance is process of keeping a server software updated and running so that a computer network can operate smoothly and avoid downtime or loss of data. Regular maintenance will keep the server running as expected and will help avoid a total or partial network failure.

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| --- |
| Server Configuration |

|  |
| --- |
| **Figure 4.22: Server Configuration** |

**Chapter 5**

**FrontEnd**

**5.1 The user interface.**

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|  |
| **Figure 5.1: sign up form** |

**On this page (Sign up form)**

If student doesn’t have an account you must make sign up by enter username , enter email and enter password and click at sign up button.

When entering the password, it can be made visible or hidden.

Before make sign up you make check of email.

If you leave an empty input text the site will automatically return to it, and it will not go to the next page unless a data check is done

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|  |
| **Figure 5.2: Login form** |

On This page (Login form)

IF student have an account, you login by enter your email and your password The student must fill out all the input boxes.

When entering the password, it can be made visible or hidden.

Before make sign up you make check of email

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| --- |
| **Figure 5.3:Page after student login** |
|  |

This page that appers after the student login

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| --- |
|  |
| **Figure 5.4: This page is shown of all students** |

This page is shown of all students, showing the deadline of the site to registration subject.

If we click on this picture, several options will appear such that:

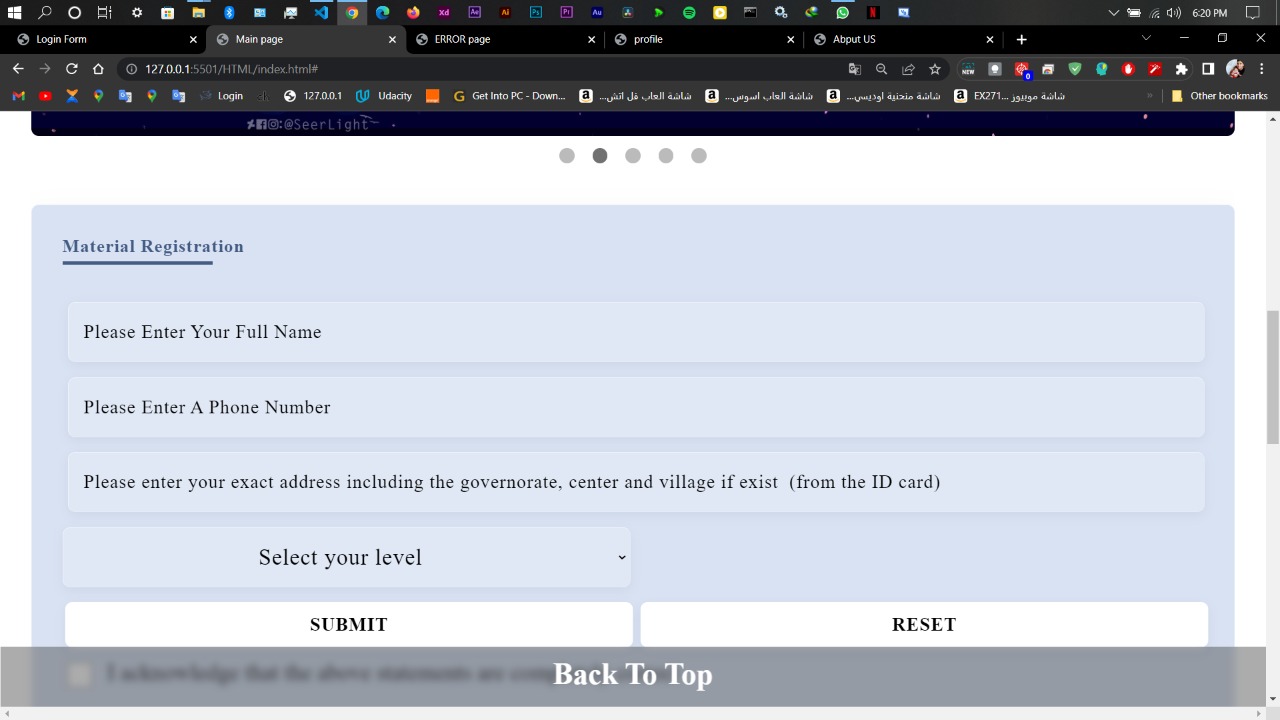
-My Profile

- Subject table

-About us

-Events

- Logout

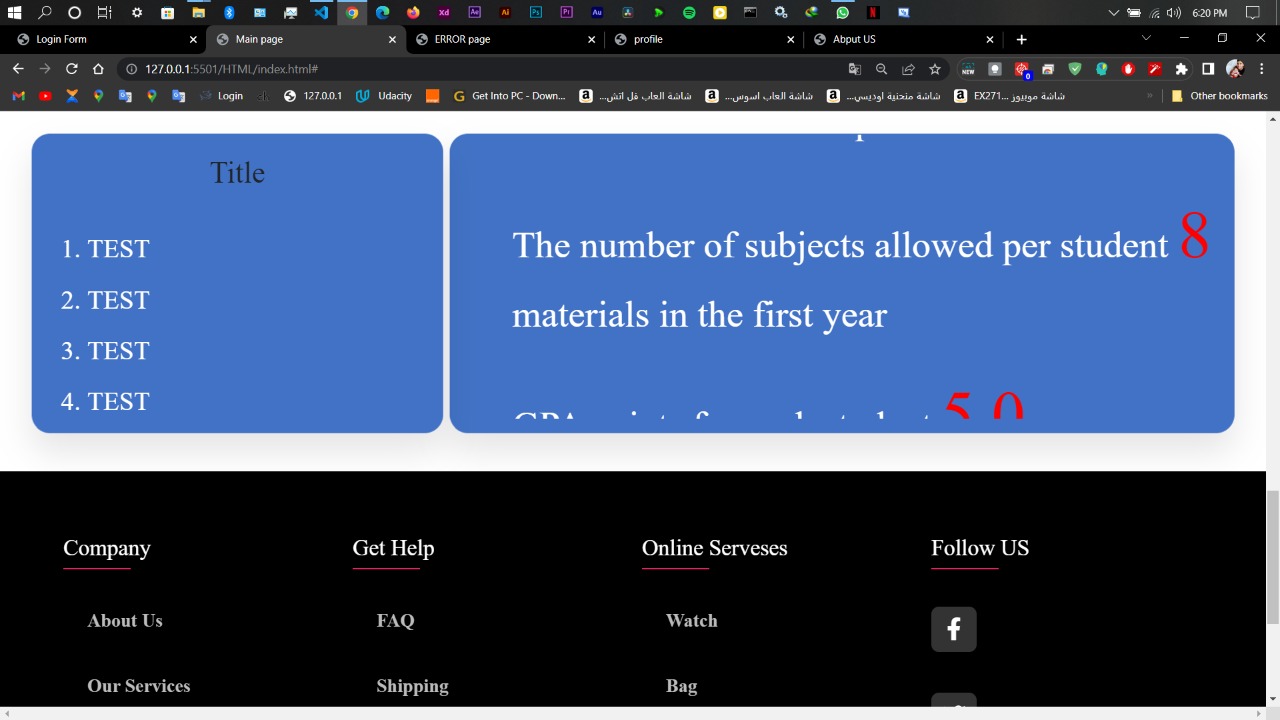


**Figure 5.5:Material Registration**

On this page, the student enter full name, enter phone number and enter address including the governorate ,center and village .

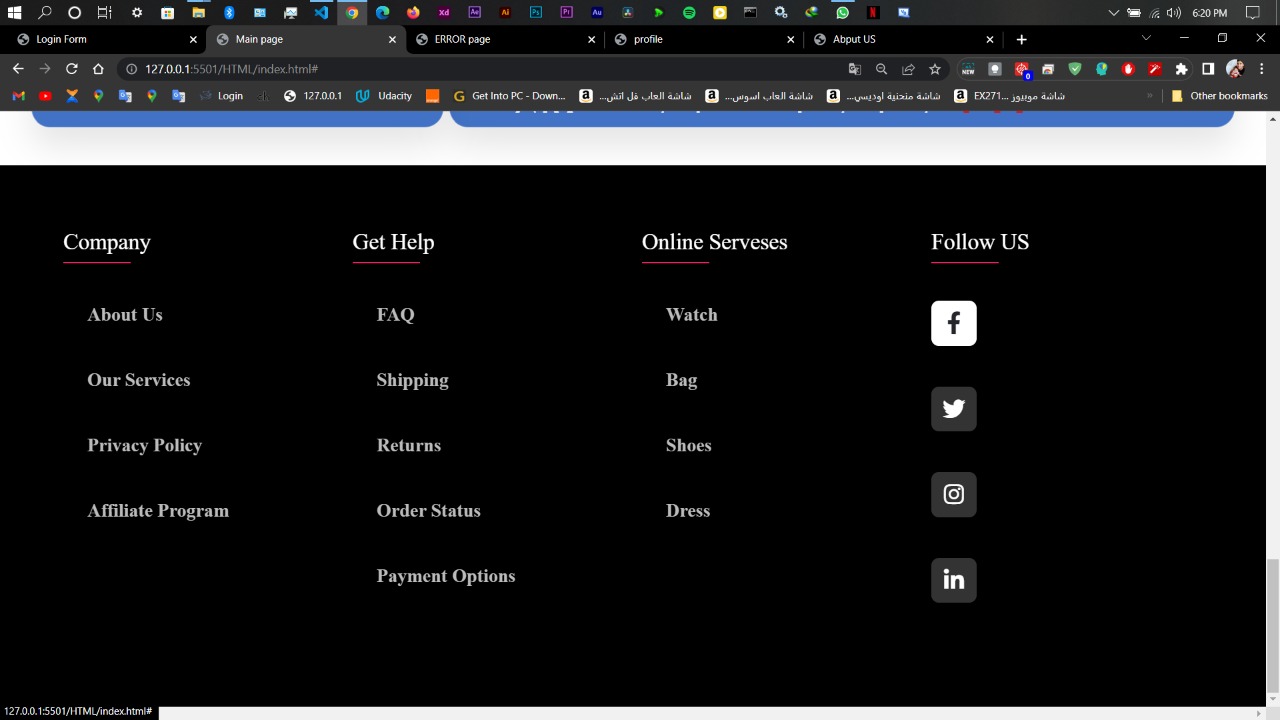
Then select your level from select you level text box , when you click in it you appears 4 levels such that level 1 ,level 2 ,level 3 and level 4 , the student choose your level

If you finished and make sure of his data click to submit button.



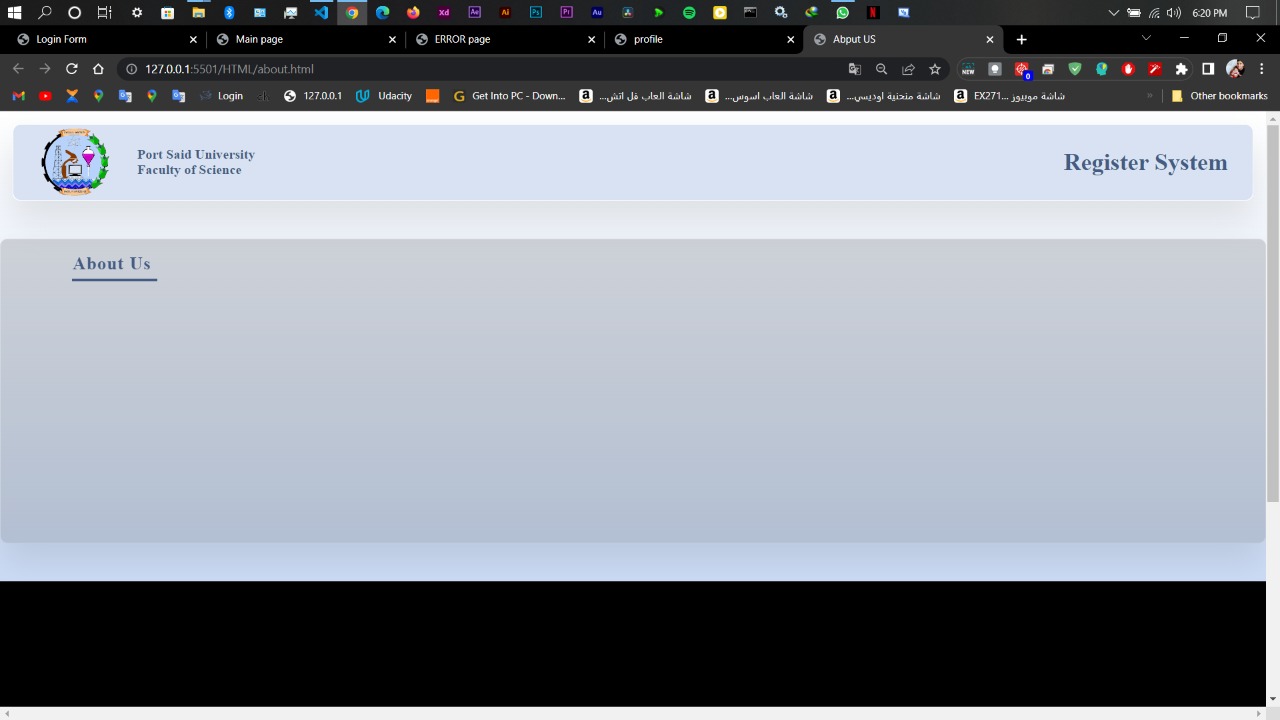
Give student information of the number of subject allowed per student materials in first year and number of hours per student

**Figure 5.6: Material Registration**

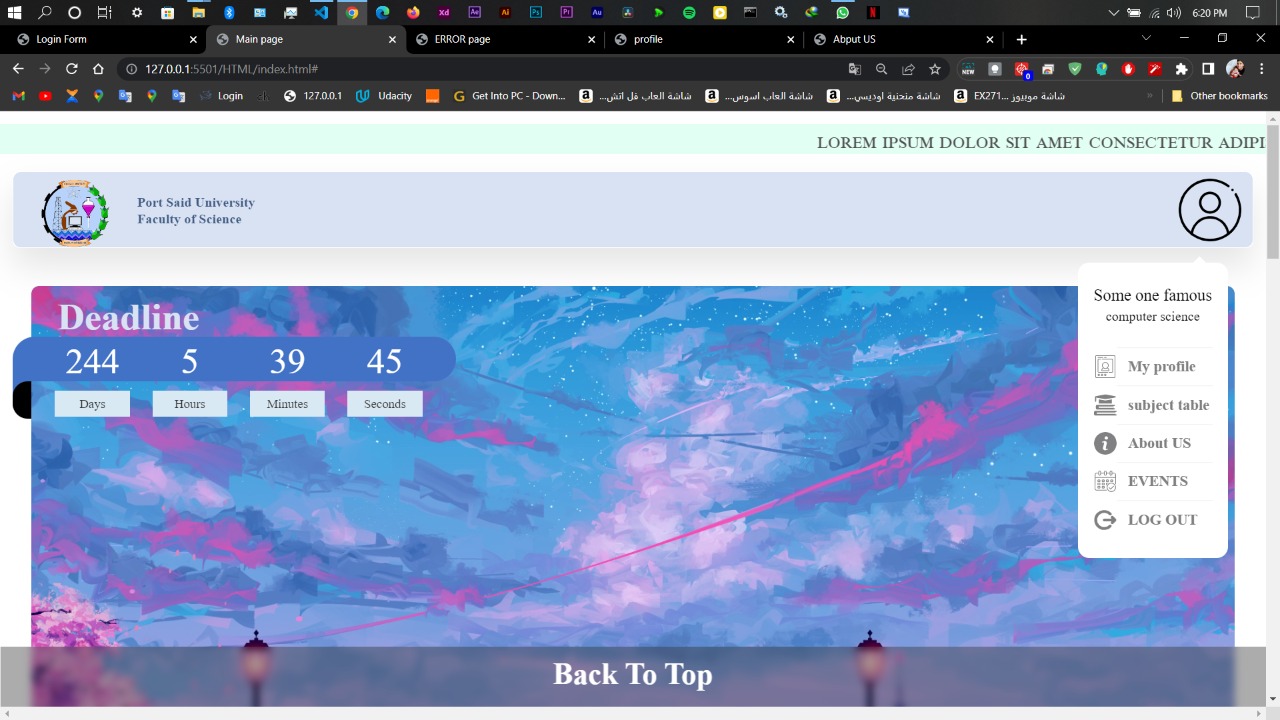


**Figure 5.7: Material Registration**

If we click to about as the following picture appears:

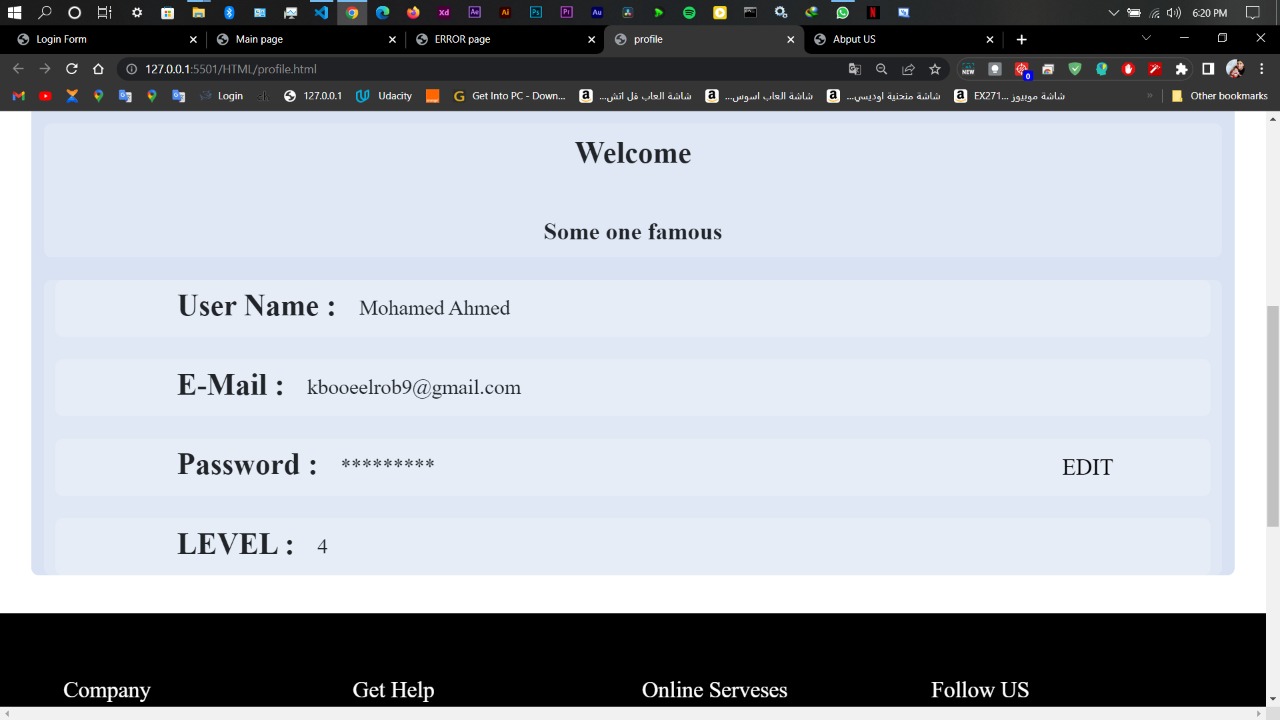


**Figure 5.8:About us**



**Figure 5.9:Page appears after student registrant materials**

In this Page, if student click to my profile then the following picture appears



**Figure 5.10: Information of student**

**5.2 interface formation.**

|  |
| --- |
| 1 |
| **Figure 5.11: Code of sign up page with html** |

The first page is the registration page through which we can create an account. On this page, we have created a section that contains many items of different types, the purpose of which is to create the registration box consisting of (username, email, password) respectively.

The first element in the section is (<h2 >Sign up <h2 >) to identify the headline.

The second element is the form, which is from the Method Post, and it is the link between this file and the HTML file. When you click on the word “Sign Up”, it will automatically convert you to the other file, which will be mentioned later.

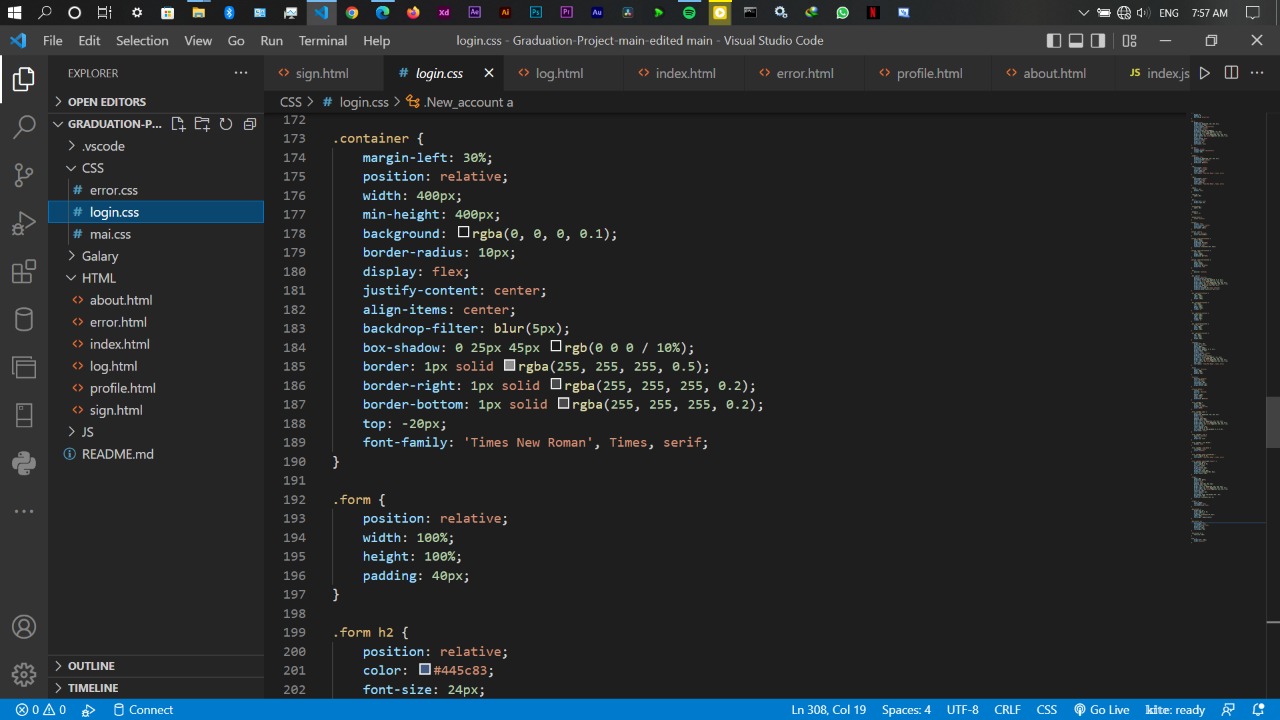
Each box contains its own title, when the reference to it appears a sentence explaining the purpose of this box.

The password box is characterized by the fact that it contains two functions.

The first function is to show the user the password to verify it before registering.

The second function is intended to hide the password again after being verified by the user.

Each of the previous functions contains its own logo that has been uploaded to express the action to occur, and this is clearer in the CSS file.



**Figure 5.12:shows the CSS file that is linked to the registration page**

The previous image shows the CSS file that is linked to the registration page and responsible for the places and colors of the registration page

The three boxes were placed in the middle using “justify-content: center;”

Shading was set at 10% for each of the green 25 pixels and blue 45 pixels.

Bordered by 1 pixel solid on each side.

Use in writing fonts (Times New Roman, Times, serif)

In the Font Family: It is often convenient to use the shorthand property font to set font-size and other font related properties all at once.

|  |
| --- |
| 3 |
| **Figure 5.13: Code of Login page with css** |

The location of the word has been set in the form "Relative" so that it takes its natural position according to the user's browsing devices.

In form h2 before The content is empty and a 1 pixel separator is set

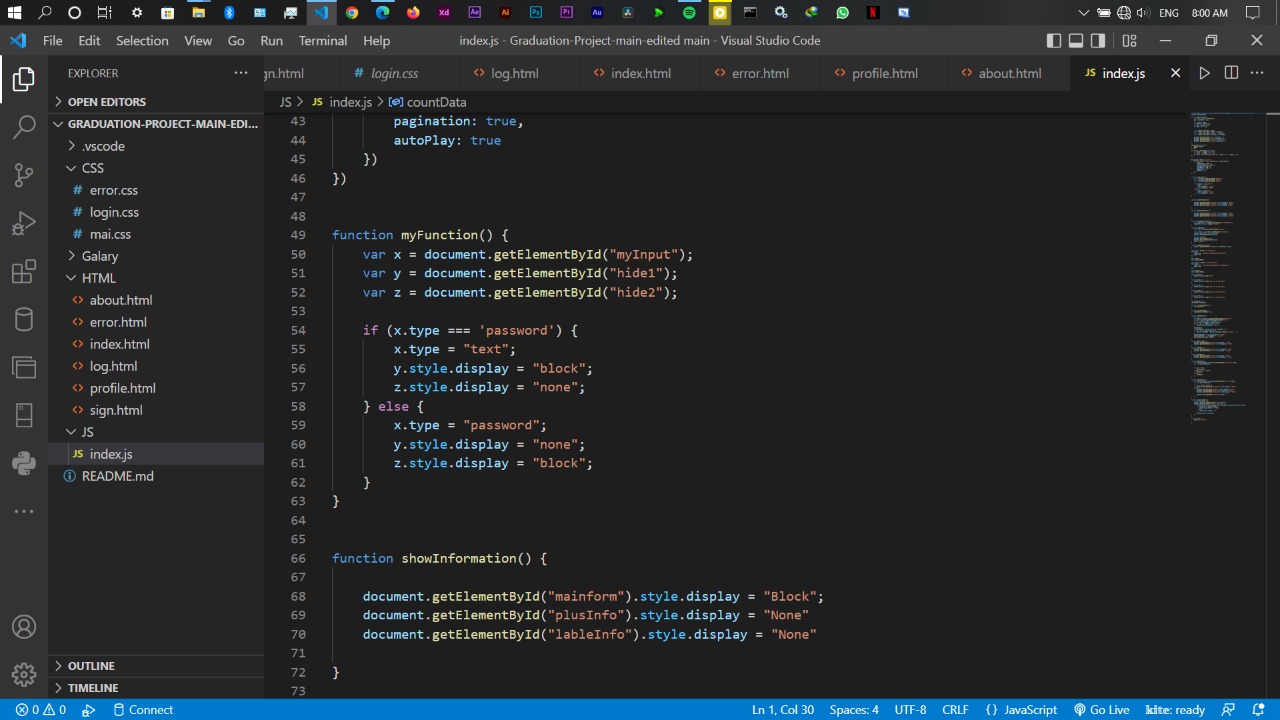
And the position has been set in these form “absolute” until he is separated from his parents.

Its position is set as shown in the previous image.

|  |
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| 4 |
| **Figure 5.14: Login css** |

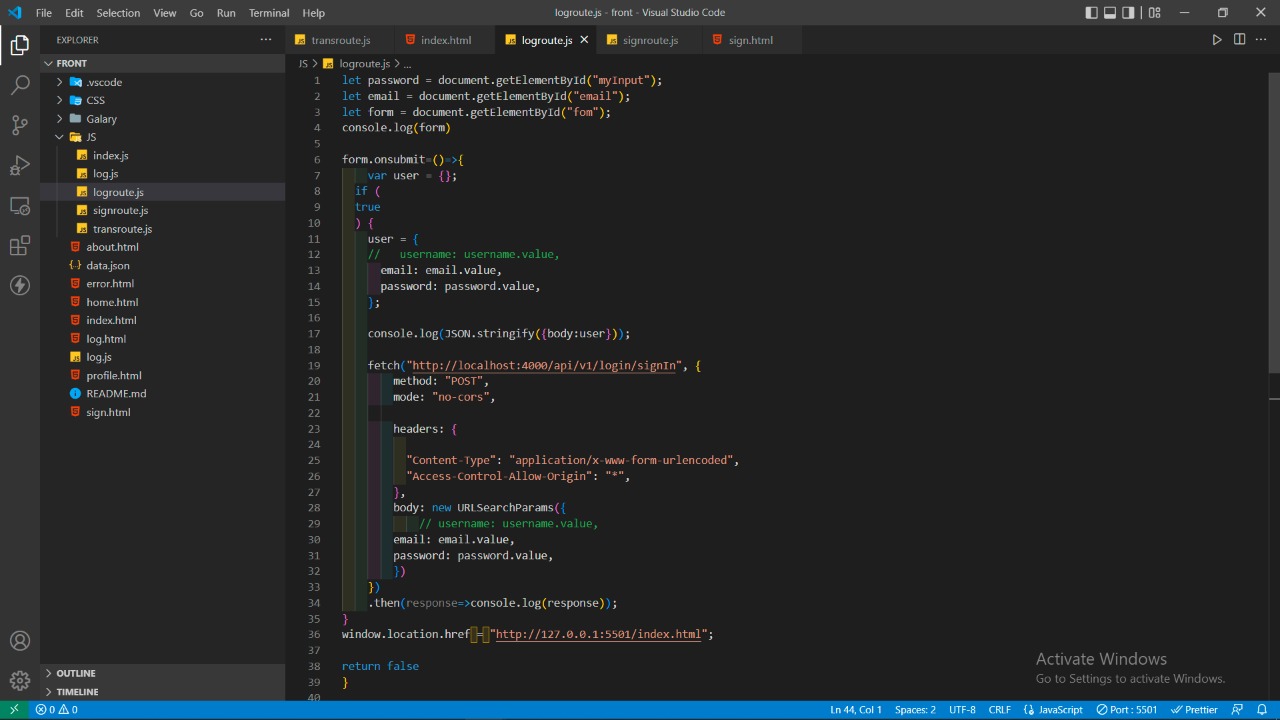
|  |
| --- |
| 5 |
| **Figure 5.15:Form InputBox** |

|  |
| --- |
| 6 |
| **Figure 5.16:Login CSS** |

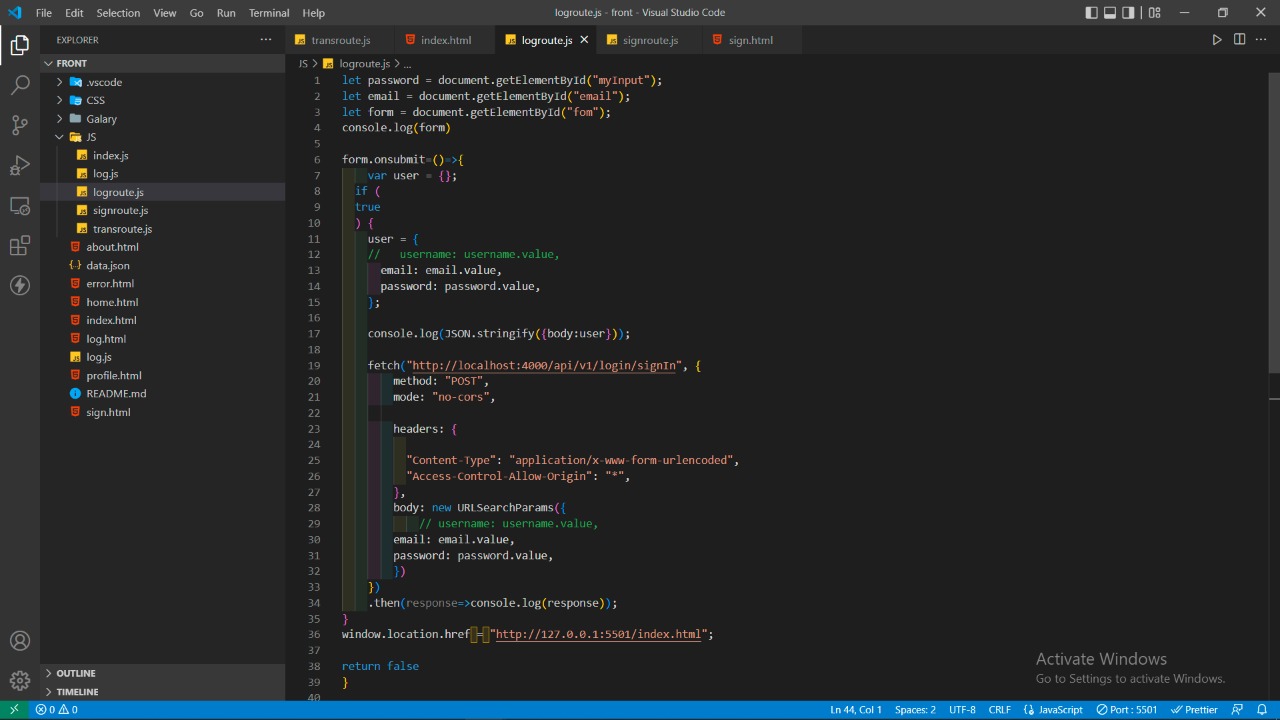


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|  |
| **Figure 5.17:Index.js** |

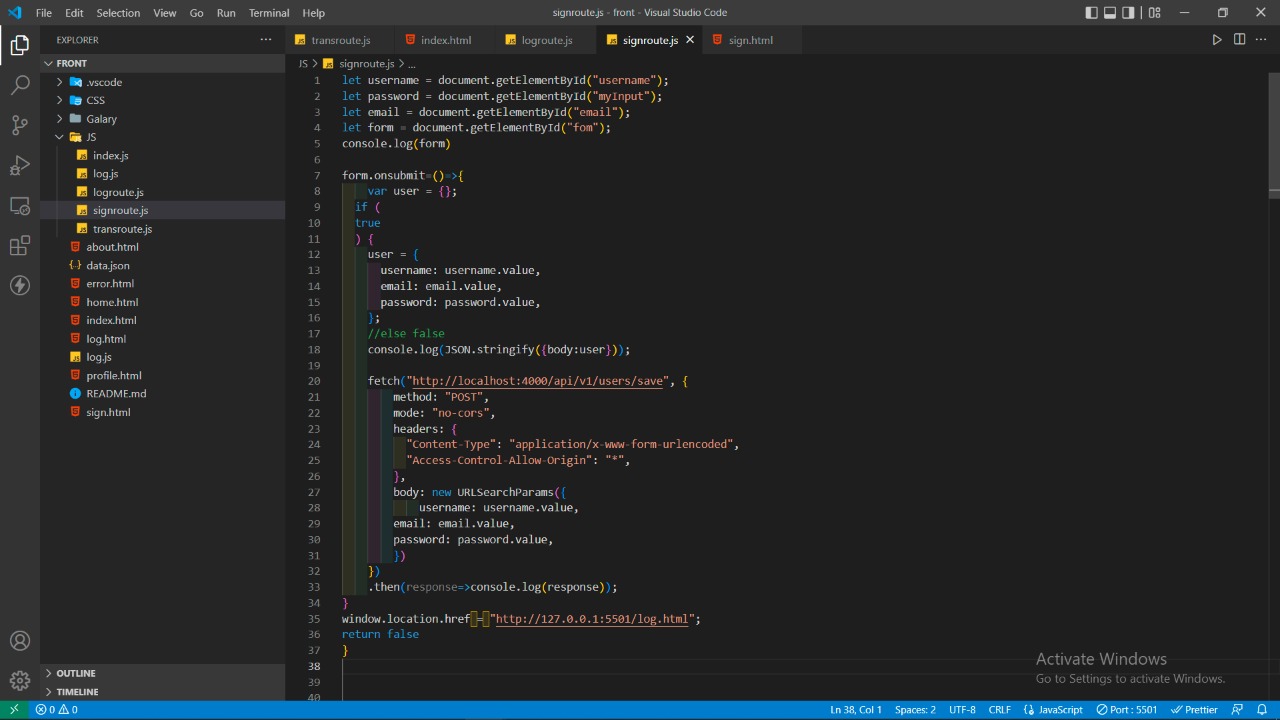
**5.3 Connection the interface to the backend**



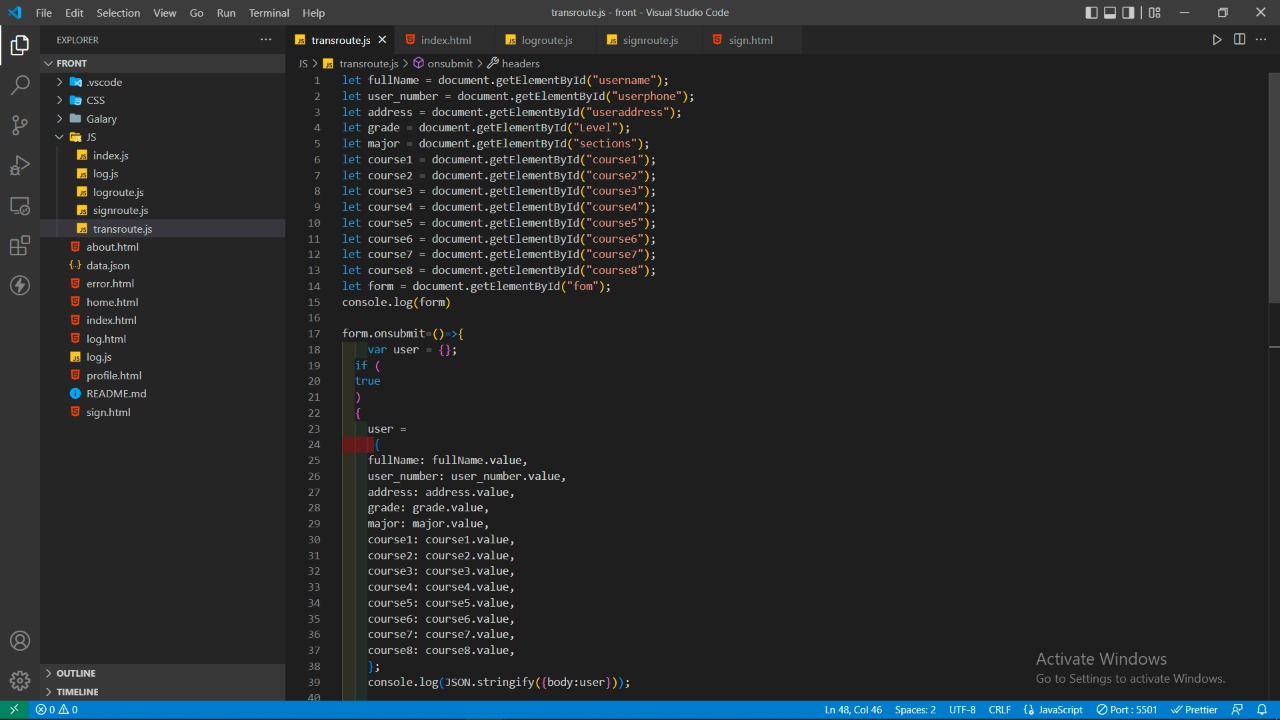
**Figure 5.18: Connection the interface to the backend**

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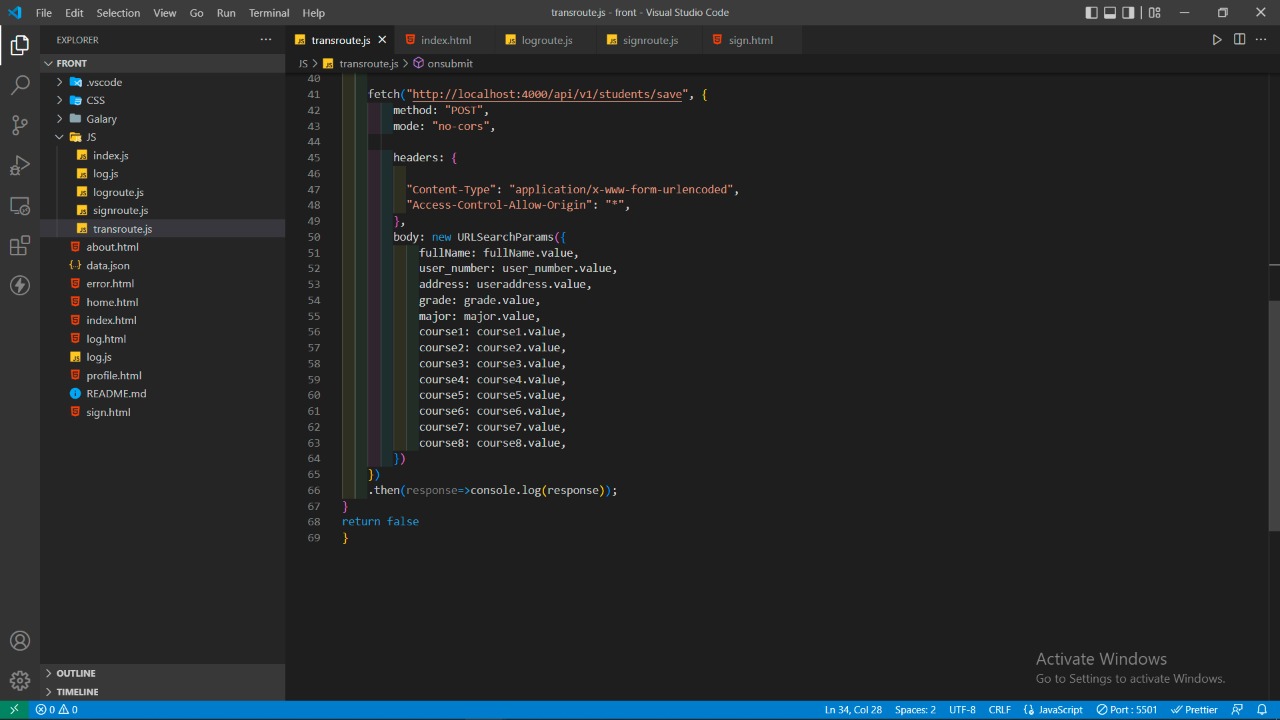
**Figure 5.19: Connection the interface to the backend**



**Figure 5.20: Connection the interface to the backend**



**Figure 5.21: Connection the interface to the backend**



**Figure 5.22: Connection the interface to the backend**

**6.Conclusion**

The aim of this project implementing the Registration System, the registration procedure has been simplified. Previously student had to go door to door in order to get the documents acknowledged from the concerned officials whereas the currently developed system offers an efficient way to perform these operations. The students can access the registration portal online either from a computer or a smart phone, and fill the necessary information and submit it for further approval. This web application provides us with ease of access, user friendliness and transparency. On the other hand, from organizations viewpoint, it helps in maintaining transparency, data consistency, data accessibility and easy maintenance.

The primary objective of project was to automate student course registration procedure. It has been achieved successfully and the system is tested to be working efficiently. The student enters his/her information during the beginning of the semester, the system verifies the data entered, and forwards it After getting the nod from the faculty and respective officials the registration form is submitted to the administrative staff of the college or university for further necessary action at their end.

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