National University of Computer and Emerging Sciences

Laboratory Manuals

for

Database Systems Lab

(CL -2005)

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Section	BCS-4H
Semester	Spring 2025

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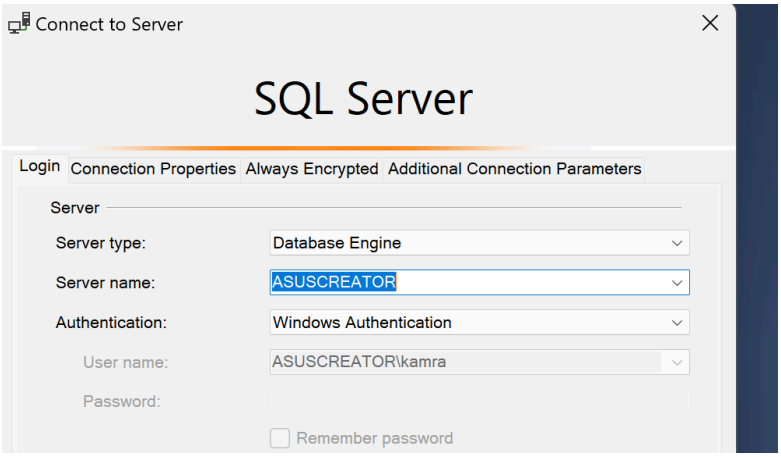
Lab Manual 01

Objectives:

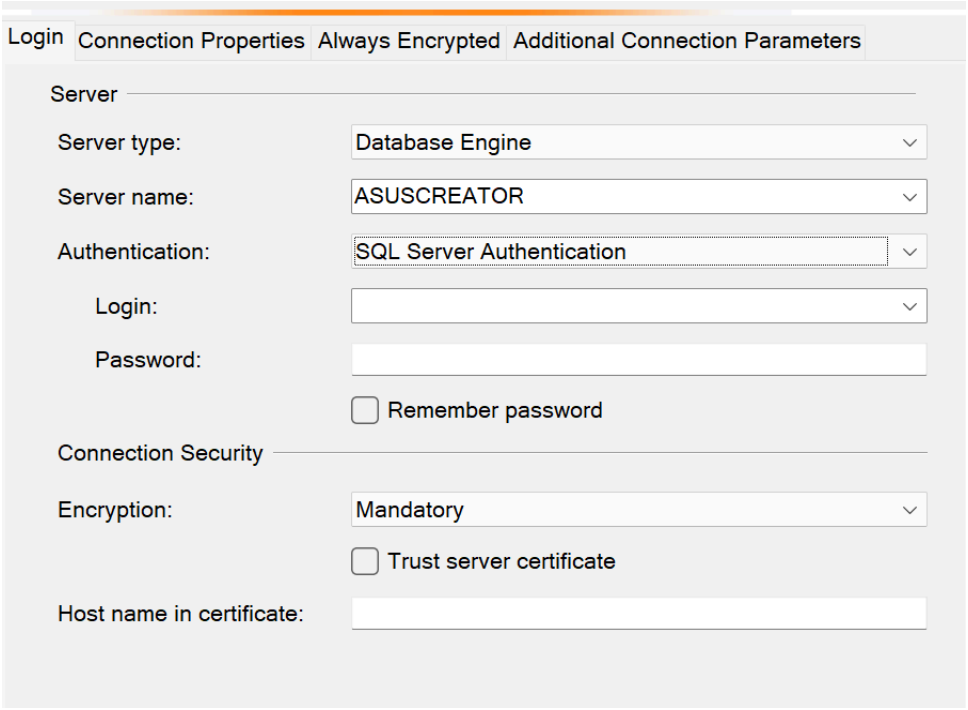
- Introduce students to the course outline and expectations.
- Familiarize students with SQL Server Management Studio (SSMS), including installation and basic configuration.
- Provide an introduction to HTML and CSS functionality.
- Practice using Visual Studio Code to set up a basic web project.

Connect to SQL Server from MSSQL Management Studio

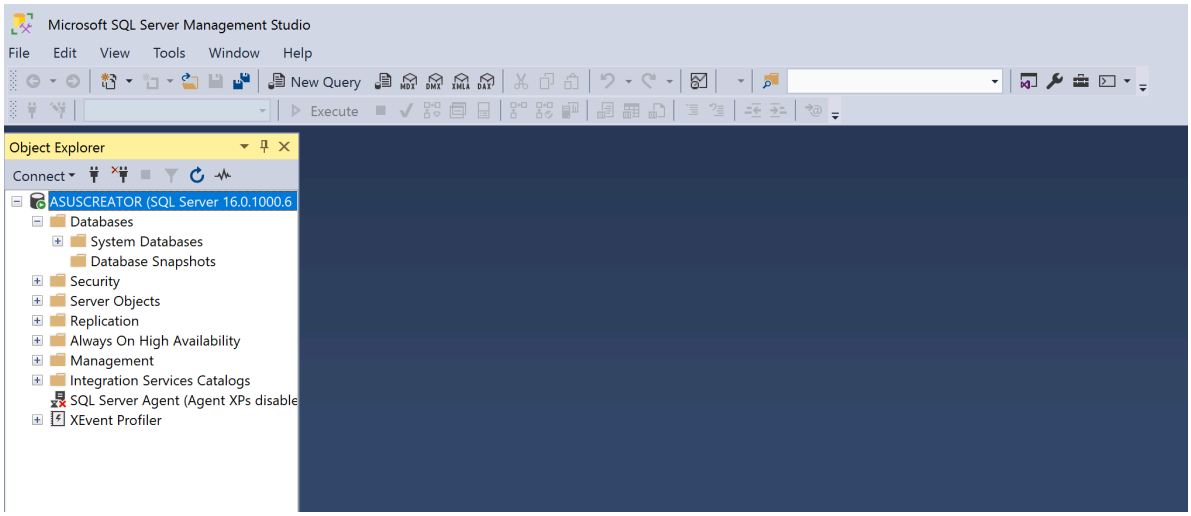
1. Open SQL Server Management Studio
2. You will see the following pop up



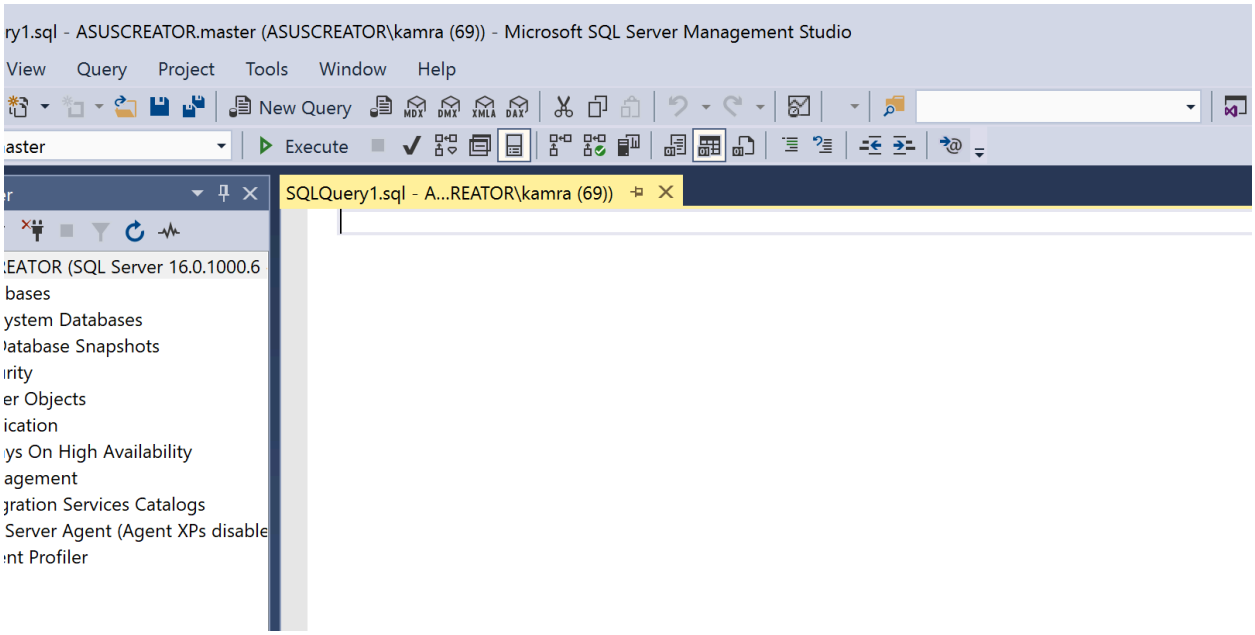
3. Enter the Server Name given by lab instructor and select SQL Server Authentication



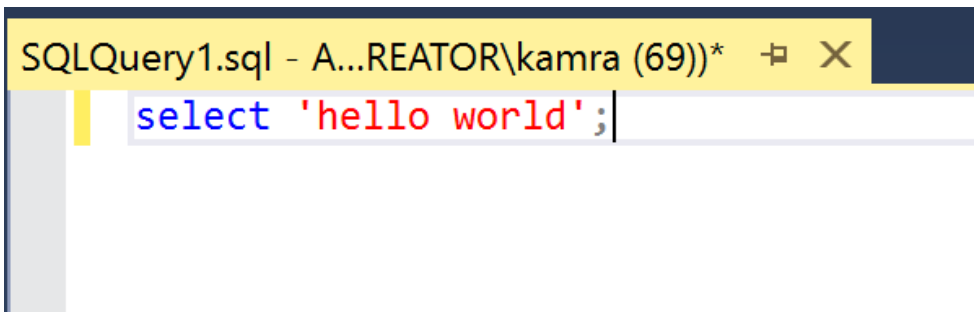
4. Click on connect after entering Username and Password. You'll be connected to the SQL Server.
5. You'll observe the screen similar to following



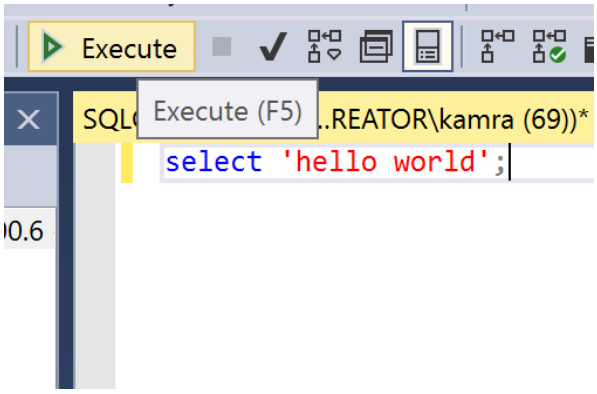
6. Click on New Query and a query file will be opened for you

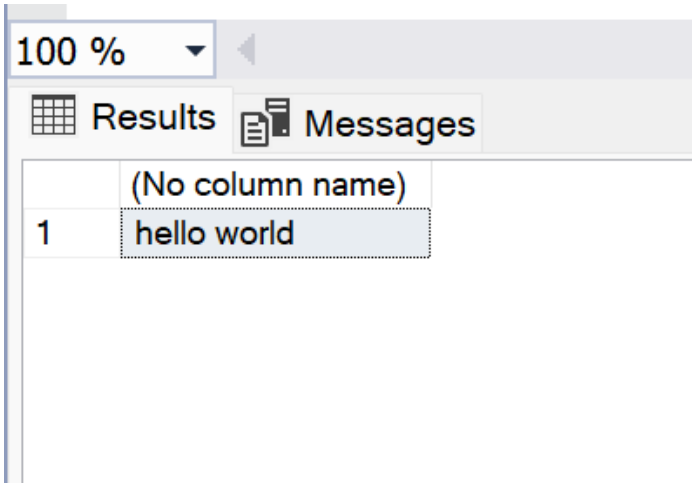


7. Write the following in the query section. This is a query to show a string “hello world” as query result



8. To execute the query click the execute button and you'll see following





Lab Exercise

1. Show the answer of 4+1 as query result
2. Show your roll number as string.
3. Show the date using the SELECT and GETDATE function.

   SELECT GETDATE();

4. Report the result of following query

   SELECT 5 + 10 AS Sum, 20 - 5 AS Difference, 4 * 5 AS Product, 20 / 4 AS Quotient;

5. Check SQL Server Version using following

   SELECT @@VERSION;

Part 2: Setting Up Node.js Backend

Step 1: Install Node.js & VS Code

1. Download and install Node.js from the official website. Only if npm and node are not installed already
2. Verify the installation using following commands on cmd
    a. node -v
    b. npm -v

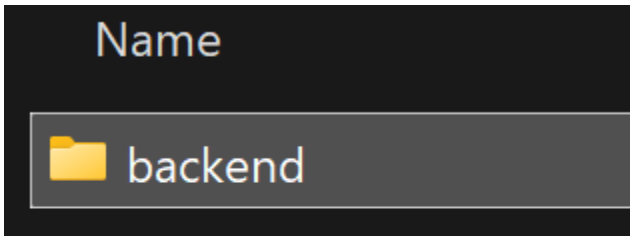
```
PS C:\Users\kamra> node -v
v21.6.2
PS C:\Users\kamra> npm -v
10.2.4
```

3. Install VS code from here. In lab, VS Code is already installed

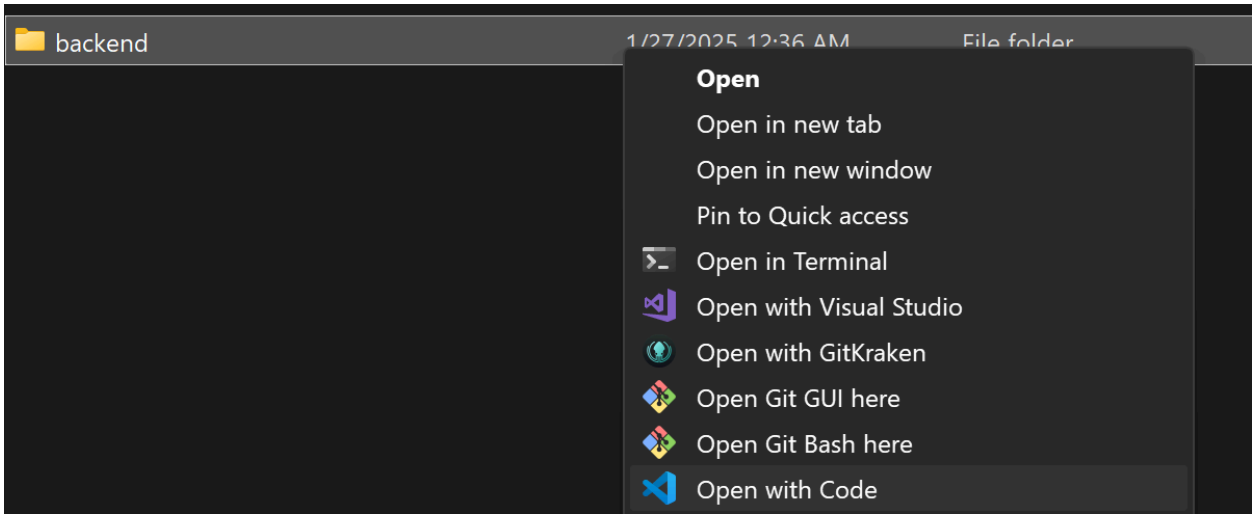
Step 2: Initialize a Node.js Project

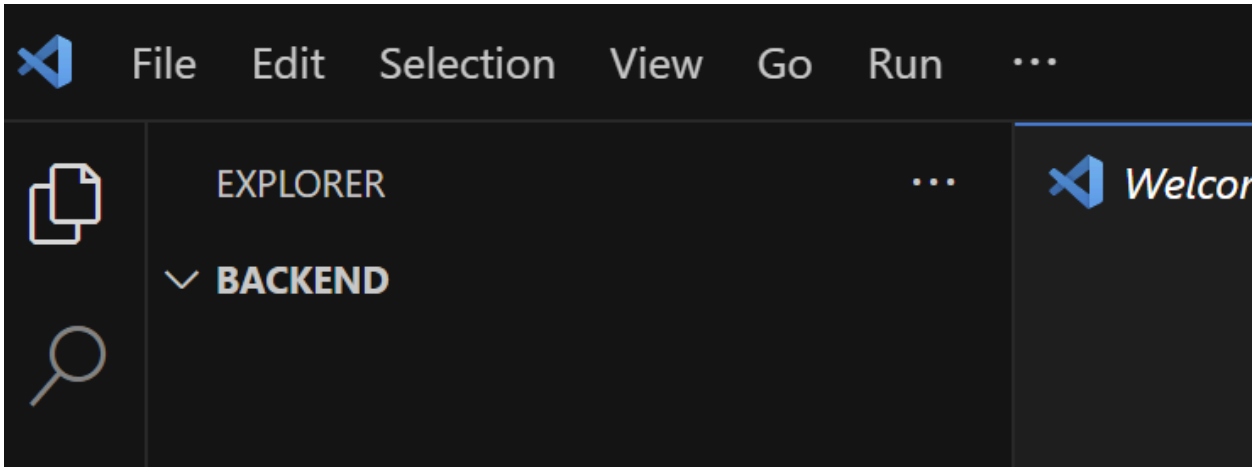
Create a Folder for a web project named “lab1”.

Create a new Folder for Backend in this project folder in “lab1” folder:



1. Open this folder with VS Code.





2. Open terminal in VS Code. (Hint: Use Ctrl + ~)

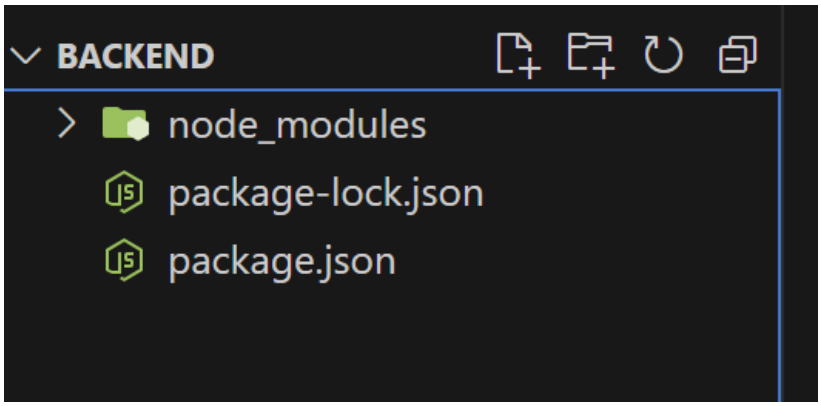
3. Initialize a Node.js project via terminal by command “npm init -y”

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\kamra\Documents\DB Projects\lab1\backend> npm init -y
Wrote to C:\Users\kamra\Documents\DB Projects\lab1\backend\package.json:

{
  "name": "backend",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC"
}
```

4. After this install express.js using following command
   npm install express

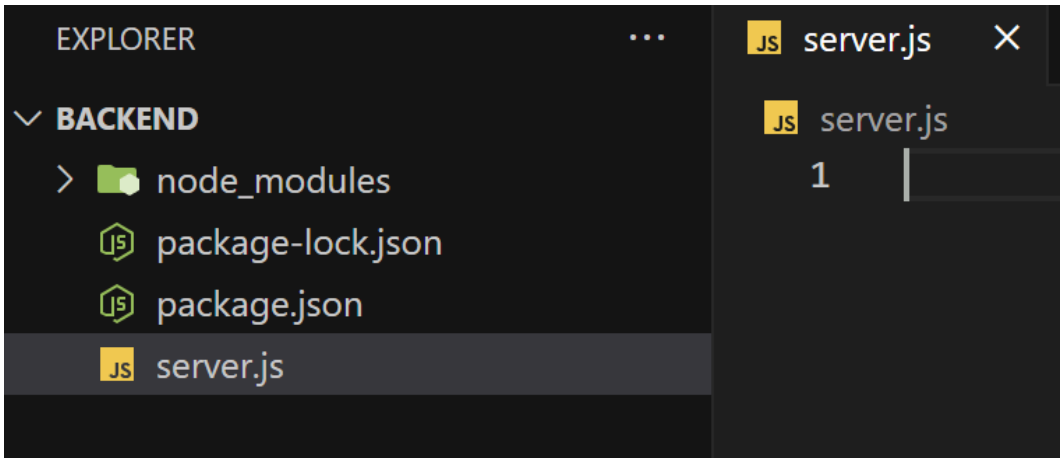
```
PS C:\Users\kamra\Documents\DB Projects\lab1\backend> npm i express

added 69 packages, and audited 70 packages in 4s

14 packages are looking for funding
  run `npm fund` for details
```

5. You will have the following folder structure



Step 3: Create a Basic Server

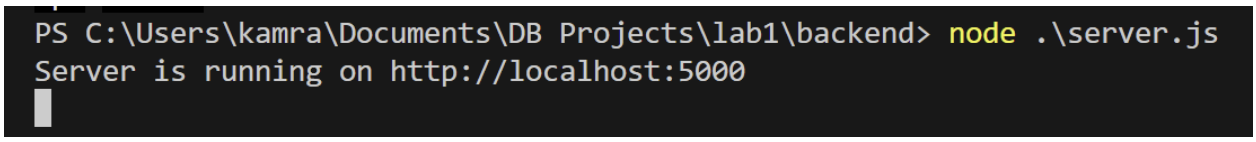
1. Create a file named server.js



2. Add the following code to server.js:

3. Run the server using following command

   node server.js



4. Open your browser and visit http://localhost:5000/ to see the response.

Hello from Node.js Backend!

Part 3: Setting Up React Frontend

Step 1: Create a React App

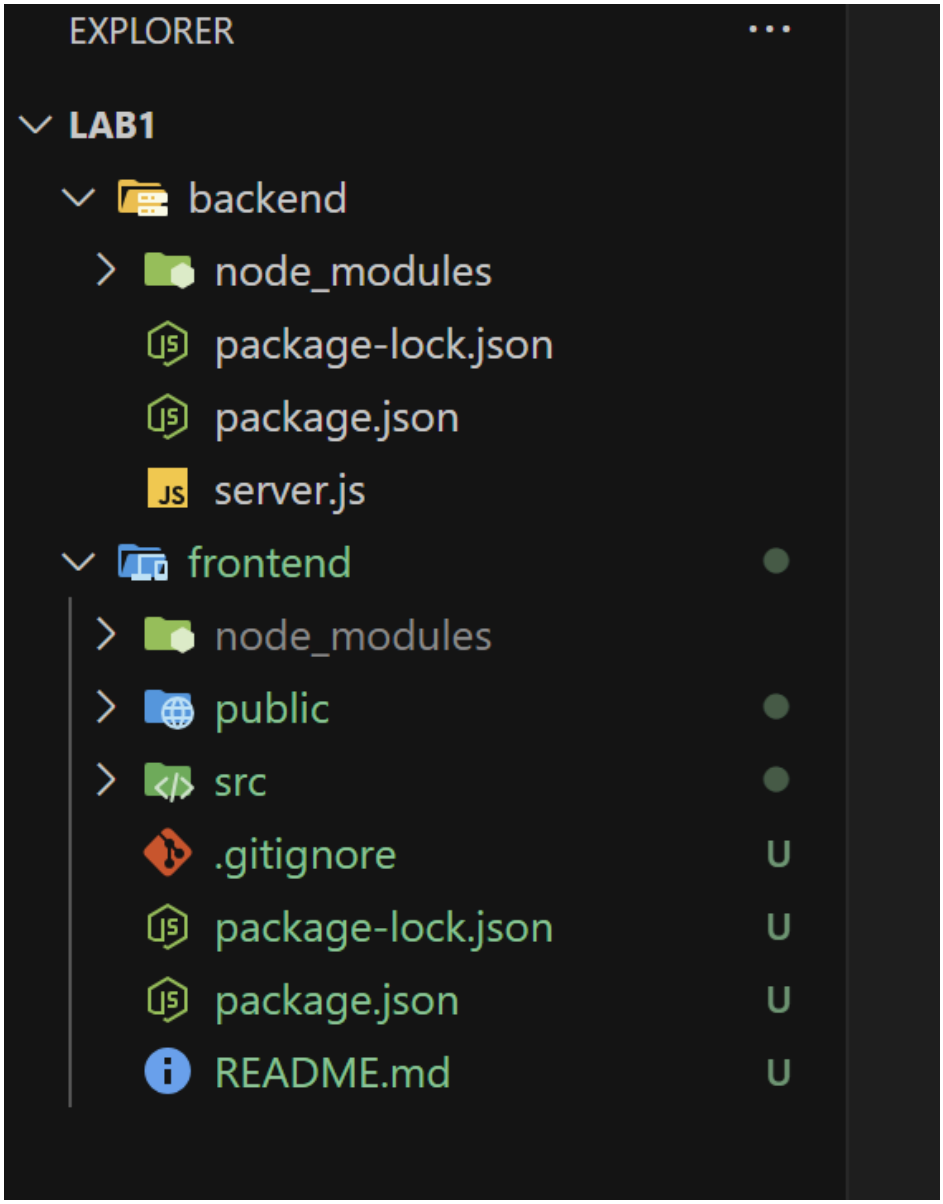
1. Open lab1 folder using terminal/cmd/powershell.
2. In a new terminal window, create a React application using following command:

```
PS C:\Users\kamra\Documents\DB Projects\lab1> npx create-react-app frontend
Need to install the following packages:
create-react-app@5.0.1
Ok to proceed? (y) y
npm WARN deprecated inflight@1.0.6: This module is not supported, and leaks memor
 a good and tested way to coalesce async requests by a key value, which is much m
npm WARN deprecated rimraf@2.7.1: Rimraf versions prior to v4 are no longer suppo
npm WARN deprecated uid-number@0.0.6: This package is no longer supported.
npm WARN deprecated glob@7.2.3: Glob versions prior to v9 are no longer supported
npm WARN deprecated fstream@1.0.12: This package is no longer supported.
npm WARN deprecated fstream-ignore@1.0.5: This package is no longer supported.
npm WARN deprecated tar@2.2.2: This version of tar is no longer supported, and wi
sap.

Creating a new React app in C:\Users\kamra\Documents\DB Projects\lab1\frontend.
```

   If create-react-app is not already installed, then use the following command to install it before creating frontend project

   npm i create-react-app

3. Now open lab1 folder with vs code:



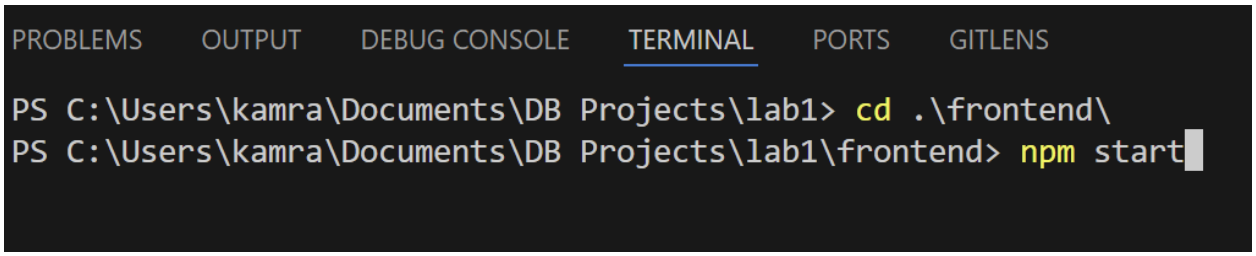
Step 2: Modify React App

Replace the App.js file for React with following content:

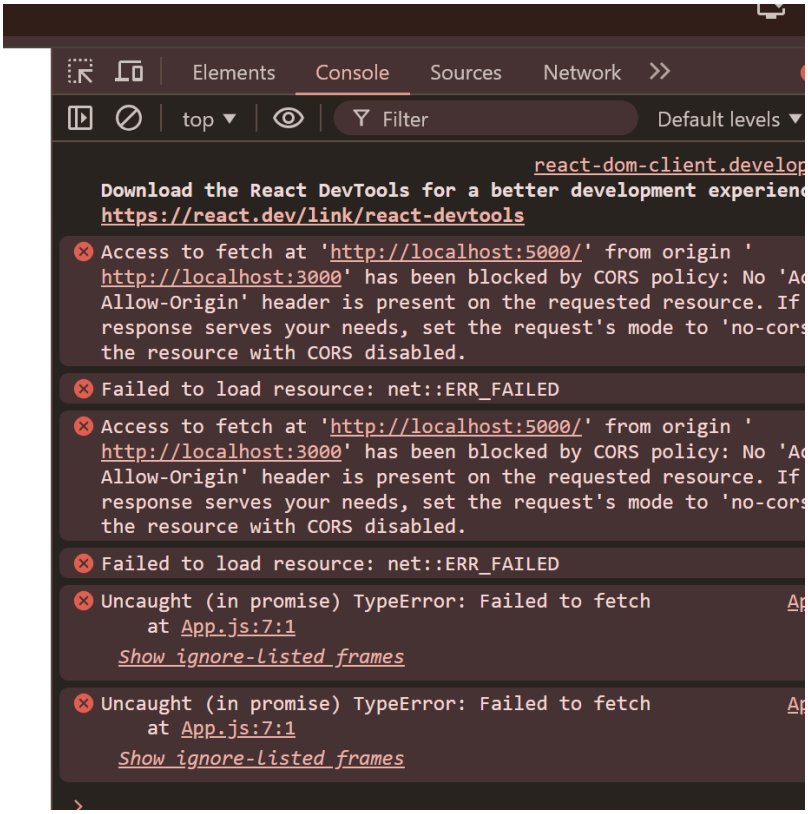
```jsx
import React, { useState, useEffect } from 'react';

function App() {
  const [message, setMessage] = useState('');

  useEffect(() => {
    fetch('http://localhost:5000')
      .then((response) => response.text())
      .then((data) => setMessage(data));
  }, []);

  return (
    <div style={{ textAlign: 'center', marginTop: '50px' }}>
      <h1>React Frontend</h1>
      <p>{message}</p>
    </div>
  );
}

export default App;
```

Step 3: Start the React App

1. Open Two Terminals One for backend and one for frontend



2. Open your browser and visit http://localhost:3000/
    - You will see following error in Dev Tools (Open Using Ctrl+Shift+I)



3. To resolve this, on backend tab install cors using this and run the backend server again after modifying server.js:

```
PS C:\Users\kamra\Documents\DB Projects\lab1\backend> npm i cors

added 2 packages, and audited 72 packages in 1s

14 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
PS C:\Users\kamra\Documents\DB Projects\lab1\backend> node .\server.js
Server is running on http://localhost:5000
```

server.js:

```
const express = require('express');
const cors = require('cors'); // Import cors

const app = express();
const PORT = 5000;

// Use CORS middleware
app.use(cors());

app.get('/', (req, res) => {
    res.send('Hello from Node.js Backend!');
});

app.listen(PORT, () => {
    console.log(`Server is running on http://localhost:${PORT}`);
});
```

4. Refresh the frontend page at http://localhost:3000/ and you will see

Note: If you face any issue regarding “web vitals” not found then use this command to install them
npm i web-vitals

Run frontend server again and you’ll have the error resolved

In Lab Exercise:

1. **Update App.js to have html to show your picture, name, date of birth, a paragraph explaining your personality and a list of goals of your life**

Name: Muhammad Kamran

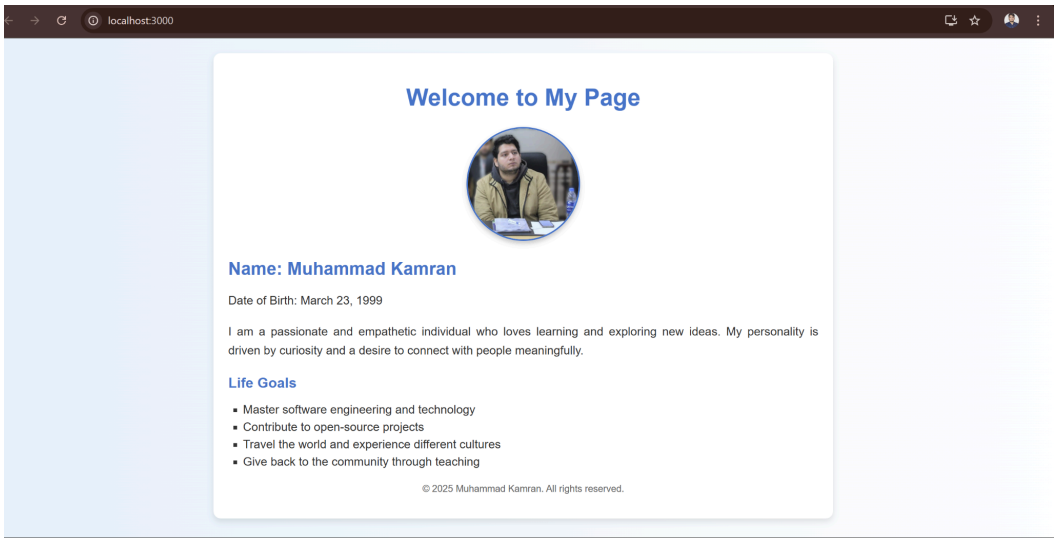
Date of Birth: March 23, 1999

I am a passionate and empathetic individual who loves learning and exploring new ideas. My personality is driven by curiosity and a desire to connect with people meaningfully.

Life Goals

Master software engineering and technology
Contribute to open-source projects
Travel the world and experience different cultures
Give back to the community through teaching

2. **Use CSS to make the information visually appealing and add one of your picture in the page**



Post Lab Exercise:

1. **Send a list of Books from backend and show it in list format on frontend**
2. **Make the information beautiful on frontend using Html and CSS**

Submission Guidelines

1. submit following files strictly following the naming convention
    a. l231234.sql
    b. l231234_server.js
    c. l231234_app.js
    d. l231234_app.css
    e. l231234_img.png