ASSIGNMENT FOR 7TH SEM PS

ASSIGNMENT FOR NODE JS DEVELOPER POSITION

Objective*:-*

Develop a Todo application using Node.js/Nest.js as the backend framework. The application should connect to a NoSQL database. This project aims to familiarise you with the fundamentals of Node.js/Nest.js, RESTful APIs, and NoSQL databases.

Requirements

1. **Backend Development:**
   - Use Node.js and Express or Nest.js to create a RESTful API.
   - Implement the CRUD API endpoints.
2. **Database:**
   - Use a NoSQL database to store todo items. Preferred database include MongoDB.
   - Design a schema for the todo items that includes:
     - `id`: Unique identifier for the todo item.
     - `title`: Title of the todo item.
     - `description`: Detailed description of the todo item.
     - `status`: Status of the todo item (e.g., pending, completed).

   Note:- Other fields can be added as per your requirements.

3. **Authentication (Optional for Extra Credit):**
   - Implement user authentication using JWT or any other method.
   - Ensure that users can only manipulate their own todo items.
   - Apart from user authentication implement API authorization also
4. **Documentation:**
   - Provide API documentation using Swagger or any other API documentation tool.
   - Include instructions on how to set up and run the project locally.
5. **Testing:**
   - Write unit tests for your API endpoints using a testing framework like Mocha, Chai, or Jest.

Deliverables

1. **Source Code:**
   - A GitHub repository containing the complete source code of the project(make the repo as public).
   - Ensure the repository has a clear README file with setup instructions.
2. **Documentation:**

    - API documentation and Instructions for setting up and running the project.

Submission Links: Submit Assignment

ASSIGNMENT FOR REACT JS DEVELOPER POSITION

Objective

Develop a Todo application using React for the frontend. This project aims to familiarise you with the fundamentals of React, state management, and interacting with APIs.

Requirements

1. **Frontend Development:**
   - Use React to create a user-friendly Todo application.
   - Implement the following features:
     - **Add Todo:** A form to add new todo items.
     - **View Todos:** A list to display all todo items.
     - **Update Todo:** Functionality to edit existing todo items.
     - **Delete Todo:** Functionality to remove todo items.
     - **Mark as Completed:** Option to mark todo items as completed or pending.
2. **State Management:**
   - Use React state and props to manage the application state.
   - Utilise React hooks (e.g., `useState`, `useEffect`) effectively.
   - Add additional features such as search, filter, or categorization of todo items.
3. **Data Integration:**
   - Get and set the dummy data from local storage
4. **Styling:**
   - Style your application using CSS or bootstrap/tailwind library like Styled Components.
   - Ensure a responsive design that works well on both desktop and mobile devices.
5. **Bonus Features (Optional for Extra Credit):**
   - Implement user authentication to allow users to manage their own todo items(store user credentials in a json file and use it for user authentication).
   - Use a state management library like Redux or Context API.

Deliverables

1. **Source Code:**
   - A GitHub repository containing the complete source code of the project.
   - Ensure the repository has a clear README file with setup instructions.
2. **Demonstration:**
   - You need to deploy the app in any of the free hosting sites(netlify/vercel) and send the url.

Submission Links: Submit Assignment

Assignment for AI/ML :- Predicting Housing Prices

Objective

Develop a simple machine learning model to predict housing prices based on various features. This task aims to familiarise you with the basics of data preprocessing, model training, and evaluation in machine learning.

Requirements

1. **Data Collection:**
   - Use a publicly available dataset such as the Boston Housing dataset or the California Housing dataset.
   - Your column names include `column_names = ['CRIM', 'ZN', 'INDUS', 'CHAS', 'NOX', 'RM', 'AGE', 'DIS', 'RAD', 'TAX', 'PTRATIO', 'B', 'LSTAT', 'MEDV']` (this is in same order as that of csv file attached in email)
2. **Data Preprocessing:**
   - Load the dataset and inspect the data.
   - Handle missing values, if any.
   - Perform feature scaling and normalisation.
   - Split the data into training and testing sets.
3. **Model Development:**
   - Implement a simple model to predict housing prices.
   - Train the model on the training dataset.
   - Evaluate the model on the testing dataset using appropriate metrics (e.g., Mean Absolute Error, Mean Squared Error).
4. **Model Evaluation:**
   - Visualise the model's performance using plots (e.g., actual vs. predicted prices).
   - Interpret the model's coefficients and understand the impact of different features on housing prices.
5. **Documentation:**
   - Document your code with comments and provide a clear explanation of each step.
   - Include a brief report summarising your findings, the model's performance, and any challenges you faced.

Deliverables

1. **Source Code:**
   - A Jupyter notebook or Python script containing the complete code for data preprocessing, model training, and evaluation.
   - Ensure the code is well-documented and easy to follow.
2. **Report:**
   - A brief report (1-2 pages) summarising:
     - The dataset and its features.

        - Data preprocessing steps.
        - Model training and evaluation results.
        - Interpretation of the model's performance and coefficients.
        - Any challenges faced during the task.

3. **Visualisation:**
    - Include visualisations (plots/graphs) in the notebook/report to illustrate the model's performance and data insights.

As the deadline for your assignments is **21st July 2024**, please find below the submission links for the respective positions you have applied for. Kindly ensure that you submit your completed assignments through the appropriate link by **21st July 2024**.

Submission Links:

- **Node.js Developer Position:**
  Submit Assignment
- **AI/ML Position:**
  Submit Assignment
- **React.js Developer Position:**
  Submit Assignment

Please ensure that you adhere to the deadline and submit your assignments only through the provided links.

NOTE : We are committed to maintaining the highest standards of integrity and originality in our selection process. Therefore, if we identify any similarities between your code submissions and those of others, both the original and copied entries will be disqualified. This will also result in the termination of any further submissions and interviews.

We appreciate your understanding and cooperation in upholding these standards.