Project Title: Knowledge Cube

Introduction

Guided projects are end-to-end projects that are aimed at handholding a learner through the process of design, development, and deployment of a Fullstack application. These guided projects are meant to be part of our Fullstack Development Program which is based on the MERN stack.

Project Outline

KnowledgeCube is an online learning platform designed to empower individuals and organizations to create and share short courses on various subjects. The platform will be built using a modern technology stack to ensure a seamless and engaging user experience for both course creators and learners. Key components of the platform will include a course creation suite, a content delivery system, and a user management system.

The front-end will be designed with a responsive and intuitive user interface, ensuring a seamless experience across various devices. The back-end will consist of a robust API that handles all data transactions and supports role-based access control to protect sensitive information. The database will store and manage all relevant data, including user information, course details, and learning progress.

Feature Set

The web-based application should provide the following feature set. Feel free to extend this to make the project more vibrant:

- **User Authentication:** This feature supports the registration, login, and role-based access control for different user types, such as administrators, course creators, and learners.
- **Course Creation Suite**: This feature enables course creators to design, publish, and manage short courses, including setting up course structure, uploading content, and creating quizzes or assessments.
- **Content Management**: This feature allows for the storage, organization, and retrieval of various types of course content, such as text, images, videos, and documents.
- **Course Discovery**: This feature enables users to search, filter, and browse through available courses based on various criteria, such as subject, difficulty level, or course creator.
- **Enrolment and Progress Tracking**: This feature allows learners to enrol in courses, track their learning progress, and resume learning where they left off.
- **Interactive Learning Experience**: This feature supports interactive elements, such as quizzes, assessments, and gamification elements, to make the learning process more engaging and effective.
- **Learner Dashboard**: This feature provides learners with a personalized dashboard displaying their enrolled courses, progress, and achievements.
- **Course Creator Dashboard**: This feature offers course creators insights into course performance, learner engagement, and feedback to help improve course quality.
- **Social Features**: This feature allows users to interact with each other through comments, discussion boards, and direct messaging, promoting a sense of community and collaborative learning.
- **Certificates and Badges**: This feature enables the issuance of completion certificates and achievement badges to learners who successfully complete courses or reach specific milestones.

Things You Can Use

The following technologies must be used for building this project:

- React + React Router + Redux (if needed)
  - Use create-react-app to setup the project
  - Utilize React's capabilities to dynamically render content, delivering a smooth user experience
  - Use Mock Service Worker during development for simulating the API
- Node.js + Express
  - Use ECMAScript Modules only
  - Refer to the latest Node.js API and specifications and implement best practices
- MongoDB Atlas as the database
- JSON Web Tokens (JWT) for secure authentication
- Libraries for secure payment processing to manage transactions
- A free SMTP provider like https://www.smtp2go.com/ (Free tier only) for sending mails
- Standard CSS or Tailwind CSS (Demonstrate setup or provide a downloadable starter template)
- Web fonts such as Google Fonts
- Icons from www.heroicons.com
- Design inspiration from Dribbble.com or similar
- Deploy on Heroku or Netlify

Things You Cannot Use

The following are prohibited for use as they're not aligned with our program curriculum:

- jQuery
- Bootstrap or similar frameworks
- SASS / LESS or similar
- Ready to use templates

Approach Note

This project is a learning asset and may be authored either as a set of videos or as readable content based on the specifics listed below:

- **Video Based**: If the project is being delivered as a set of videos, then you should break down the project into three broad modules:
  - **Project overview:** This module should have multiple videos that explain the end goal, the approach, tools, and architecture.
  - **Building the Frontend:** This module should contain videos where you build the React based frontend using MSW for mocked APIs. In our program, we will position this along with the overview module at the end of frontend development topics.
  - **Building the Backend:** This module should contain videos which explains how the backend is built using Node.js etc. and then should end with deploying the Fullstack application. We will position this module at the end of the program by when learners have a thorough understanding of the end-to-end process.
- **eBook:** This project may alternatively be authored in a readable format. In this case, create two documents (Microsoft Word) as explained below:
  - **Book 1 | Project Overview and Building the Frontend:** This document should contain two sections, one each for the overview and the frontend. Each section should have multiple chapters, covering detailed step by step workflows for building features and assets. Include high quality and clean screenshots as well.
  - **Book 2 | Building the Backend and Deployment:** This concluding document should chapters outlining the step-by-step process for building the backend and ultimately the process of

deployment on the cloud. Include high quality and clean screenshots as well.

- **FAQs:** Please include a section with frequently asked questions about the project, its setup, the approach etc.

Duration (Video Based)

If you're building a video-based project, then keep the duration anywhere between 4 - 12 hours depending on the complexity of the feature set and the overall development process.

Deliverables

For Video-Based: If you're building a video-based project, then the following would need to be delivered to us. Our content team will work closely with you to help you organise and deliver these assets:

- **Starter Kit (If needed):** This would be the ready to use project which learners should be able to open in VSCode, install dependencies and begin developing the project.
- **Completed Code:** A folder containing the completed application, properly documented using a Readme.md file with instructions to get it up and running.
- **Videos:** Screen recordings must be done on a resolution of 1920 x 1080 and delivered to us as MP4 files, encoded at the highest quality possible. If you're not recording the verbal instruction extempore, then please also provide scripts and audio files (WAV format) separately in addition to an edited MP4 edition. The duration of each video may range from 5 minutes to 30 minutes at max.
- **Complexity:** Depending on the nature of the project, please rate it as 'Beginner', 'Intermediate' or 'Advanced'

For eBooks: If you're building an eBook, then both Book 1 and 2 should be provided to us as Microsoft Word documents using a sans-serif font for text and mono-spaced font for code. Include screenshots in the document as well as screen grabbed originals in a separate folder as we would be publishing the content as HTML pages on our platform. Please also include:

- **Starter Kit (If needed):** This would be the ready to use project which learners should be able to open in VSCode, install dependencies and begin developing the project.
- **Completed Code:** A folder containing the completed application, properly documented using a Readme.md file with instructions to get it up and running.
- **Complexity:** Depending on the nature of the project, please rate it as 'Beginner', 'Intermediate' or 'Advanced'