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RAMRAO ADIK
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PRESENTS

NATIONAL LEVEL HACKATHON

MIRAI

GENERATIVE AI

Zero Gravity

Thiagarajar College of Engineering

Team member details

Team Name	Zero Gravity			
Institute name	Thiagarajar College of Engineering			
Team members >	1 (Leader)	2	3	4
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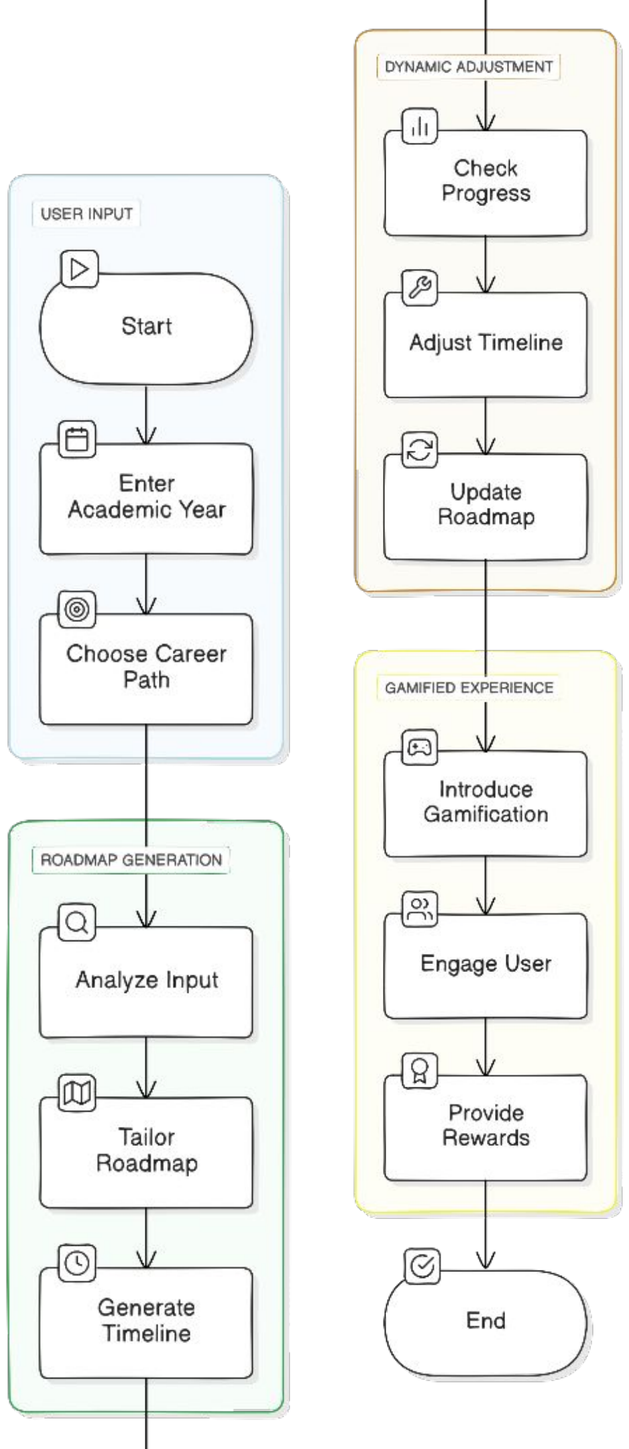
Batch	2021-2025	2021-2025	2021-2025	

Functionalities of product

- **What is the product's USP?**

1. **Personalized Career Guidance:** Tailors a unique roadmap for each engineering student based on their current academic year and desired career path.
2. **Dynamic Timeline Generation:** Adjusts the skill acquisition and career preparation timeline based on the student's progress and consistency. The student submits their work, which is then evaluated to update the timeline (current progress) in the roadmap.
3. **Gamified Learning Experience:** Engages users with a gamified approach, making the learning and preparation process interactive and enjoyable. The user acts as a player who initiates a game-like environment, gradually advancing levels by completing main quests (projects) and side quests (technical concepts).

Diagram: Illustrate the process from user input to personalized roadmap generation and dynamic timeline adjustment



Gamified Learning Experience

Game Mechanics:

- **Quests:** Learning tasks are presented as "quests" with clear objectives.
  - **Main Quests:** Focus on core skills and projects aligned with the chosen career path.
  - **Side Quests:** Explore technical concepts, tools, or industry knowledge.
- **Leveling System:** Users progress through levels by completing quests, symbolizing skill mastery.
- **Points & Badges:** Award points for completed tasks and special achievements. Badges can be earned for milestones or demonstrating proficiency in specific areas.

Rewards System:

- **Unlocking Content:** Completing quests unlocks new content, resources, or advanced learning paths.
- **Early Access to Features:** Higher levels grant early access to new platform features or exclusive events.

User Engagement:

- **Progress Visualization:** Clearly display user progress, level, points, and badges to maintain motivation.
- **Regular Challenges:** Introduce regular challenges or time-limited events to keep users engaged.

Source: Genshin Impact

Display the player's progress on a dashboard highlighting relevant skills and talents aligned with the user's career path.

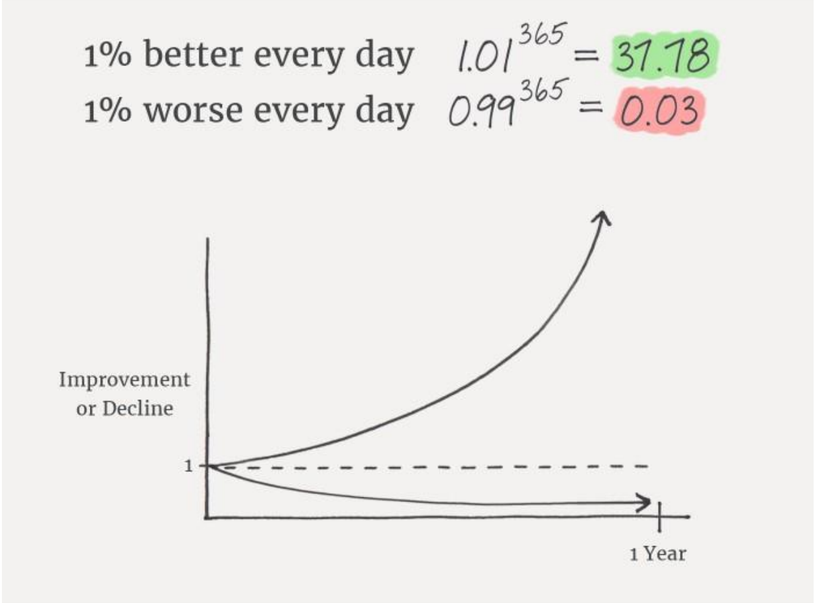
Dynamic Timeline Algorithm

Evaluation Criteria:

- **Project Completion:** Assess code quality, functionality, adherence to best practices, and documentation.
- **LLM Model:** Fine-tune Ollama and Gemini Flash (pro users) model to evaluate code, assignments, and quizzes, providing automated feedback and proficiency assessments.
- **Consistency & Engagement:** Factor in regularity of task completion, time spent on learning activities, and participation in community features.

Timeline Adjustment Logic:

1. **Skill Proficiency Level:** Based on evaluation results, assign a proficiency level (e.g., beginner, intermediate, advanced) for each skill.
2. **Placement Season Timeline:** Retrieve the expected timeline for campus placements based on the user's academic year and institution.
3. **Dynamic Adjustment:**
    - **Faster Progress:** If users demonstrate proficiency ahead of schedule, accelerate the timeline to introduce more advanced topics and challenges.
    - **Slower Progress:** If users require more time, adjust the timeline to provide additional support, resources, and extended deadlines.



Source: "Small habits compound like interest, and a tiny improvement each day leads to remarkable results over time." - James Clear, *Atomic Habits*

Functionalities of product

- **What is the technology used for the product? - Are there any licensed tools being used?**

1. **React.js:** For building a responsive and interactive front-end user interface.
2. **Django:** For back-end development, handling user authentication, data processing, and API integration.
3. **MongoDB:** For storing user profiles, career roadmaps, task data, and other relevant information.

Licensed tools:

4. **Ollama:** Fine-tune Ollama models to give personalized recommendation, Skill Assessment and Content Generation.
5. **GPT-4o API:** For custom dataset generation in order to fine tune Open Source Ollama models
6. **Groq API:** To accelerate inference tasks, particularly for LLMs, by overcoming the compute and memory bandwidth bottlenecks that traditional processors face (30 calls per minute - Rate limited)
7. **Gemini Flash API:** Provide a Standard model for better reasoning and long context window to premium subscription

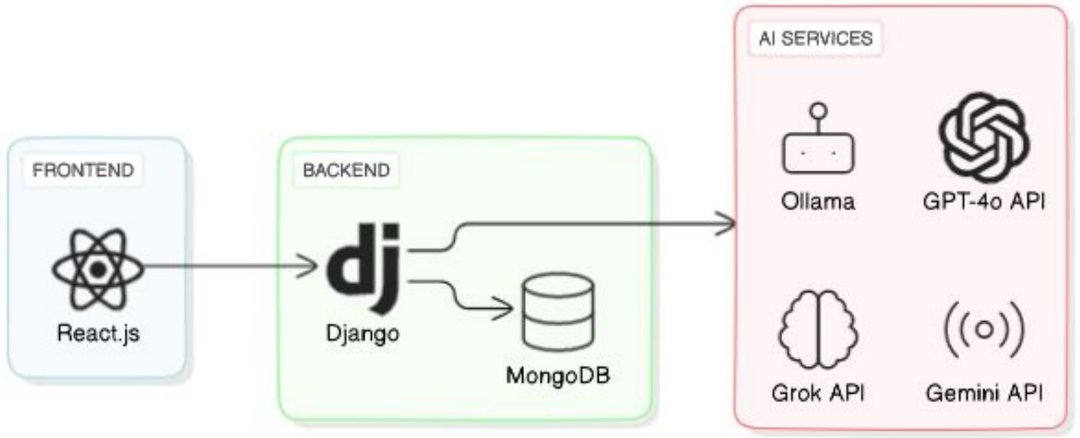


Diagram: A technology stack diagram to show the integration between technology used and Licensed tools.

Functionalities of product

- **How easy it to scale the product to any new template?**

1. **Modular Architecture:** The use of a modular architecture allows easy addition of new templates and features without affecting existing functionalities.
2. **API-Driven:** The application is designed to be API-driven, enabling seamless integration with various services and third-party tools.
3. **Cloud-Based Deployment:** Utilizing cloud solutions like AWS or Azure ensures scalability and efficient resource management.

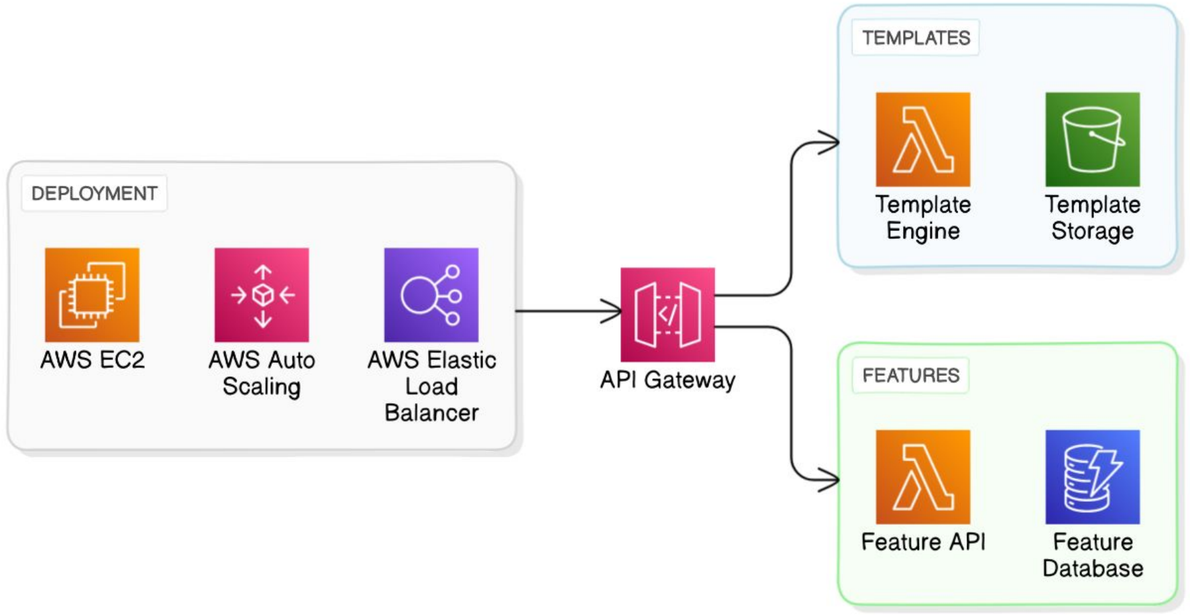


Diagram: An architecture diagram to show the modular components and their interactions.

Product Specifications

- **Technical and Physical Specifications**
  1. **Responsive Design:** Optimized for use on various devices including desktops, tablets, and smartphones.
  2. **Scalable Database:** MongoDB ensures efficient handling of large volumes of data with scalability.
  3. **Secure Authentication:** Implementing JWT for secure user authentication and data protection.
- **Product Limitations**
  1. **Dependency on User Input:** The accuracy of the personalized roadmap depends on the completeness and correctness of user-provided information.
  2. **Internet Access Required:** Continuous internet connectivity is necessary for accessing online resources and updating the roadmap dynamically.
  3. **Groq API Limits:** Groqcloud restricts its LPU inference support to 30 requests per minute and 30,000 tokens per minute. This capacity is sufficient for a prototype but inadequate for production scale. The solution is to upgrade to GroqCloud Enterprise API solutions or rent GPUs.
  4. **Scalability Challenges:** Despite MongoDB and AWS's ability to handle large data volumes, the platform's performance may suffer under very high user loads or rapid growth in the user base without appropriate scaling strategies.
  5. **Mobile App Support:** Currently, mobile users must access the platform via the website. While PWA support could be provided, a dedicated mobile app is planned for development in the near future.

*Optional

Architecture

Tech/Hardware Architecture

1. **Front-End:** React.js, Redux for state management.
2. **Back-End:** Django, RESTful APIs.
3. **Database:** MongoDB.
4. **Cloud Services:** AWS for hosting, S3 for storage.
5. **AI Services:** Ollama, GPT-4o API, Grok LPU API, Gemini Flash API

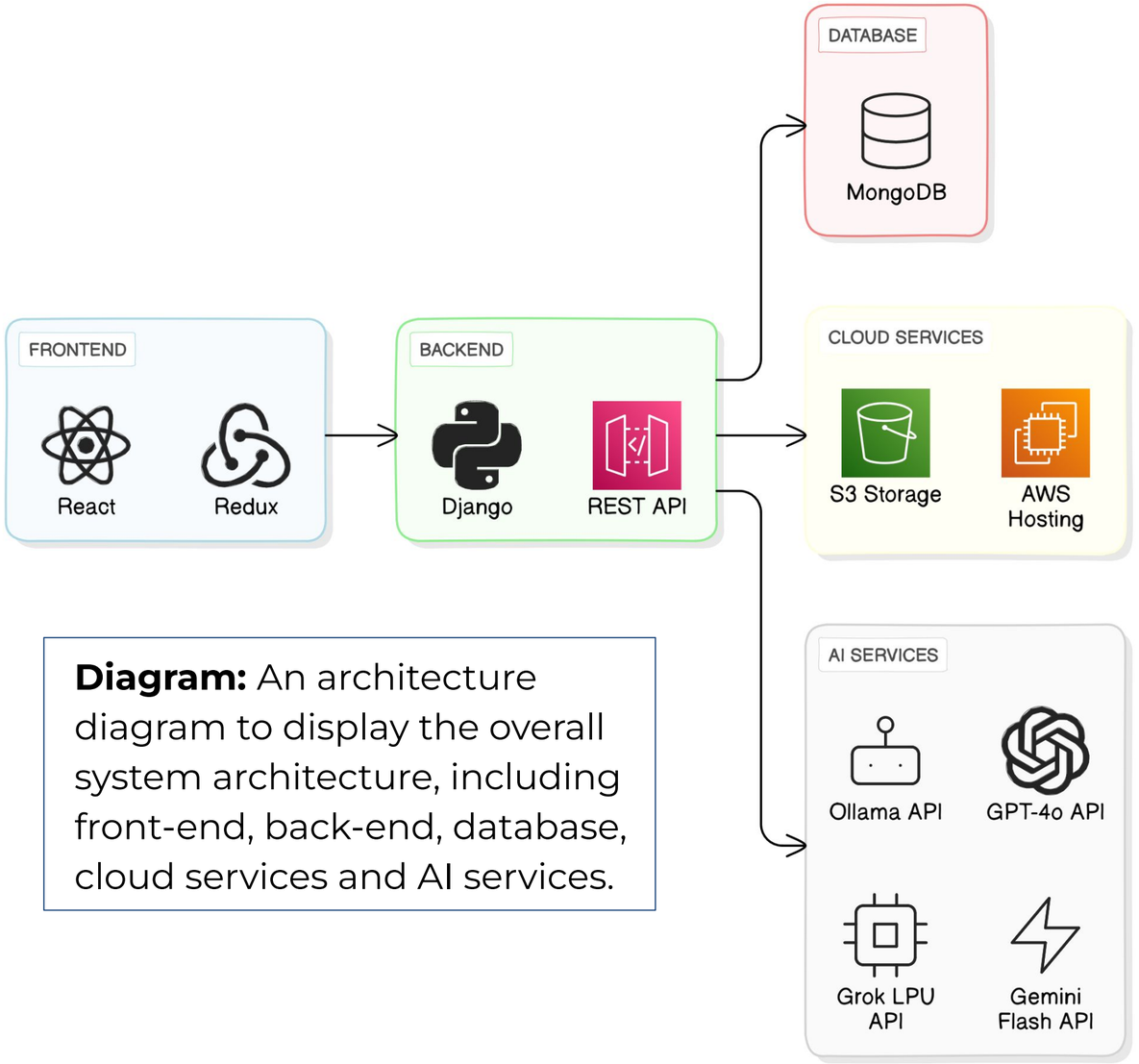


Diagram: An architecture diagram to display the overall system architecture, including front-end, back-end, database, cloud services and AI services.

Brief on Programming Module

What programming language will be used?

1. **JavaScript:** For front-end development.
2. **Python:** For back-end development with Django and AI + Cloud Services.
3. **HTML/CSS:** For structuring and styling the web interface.

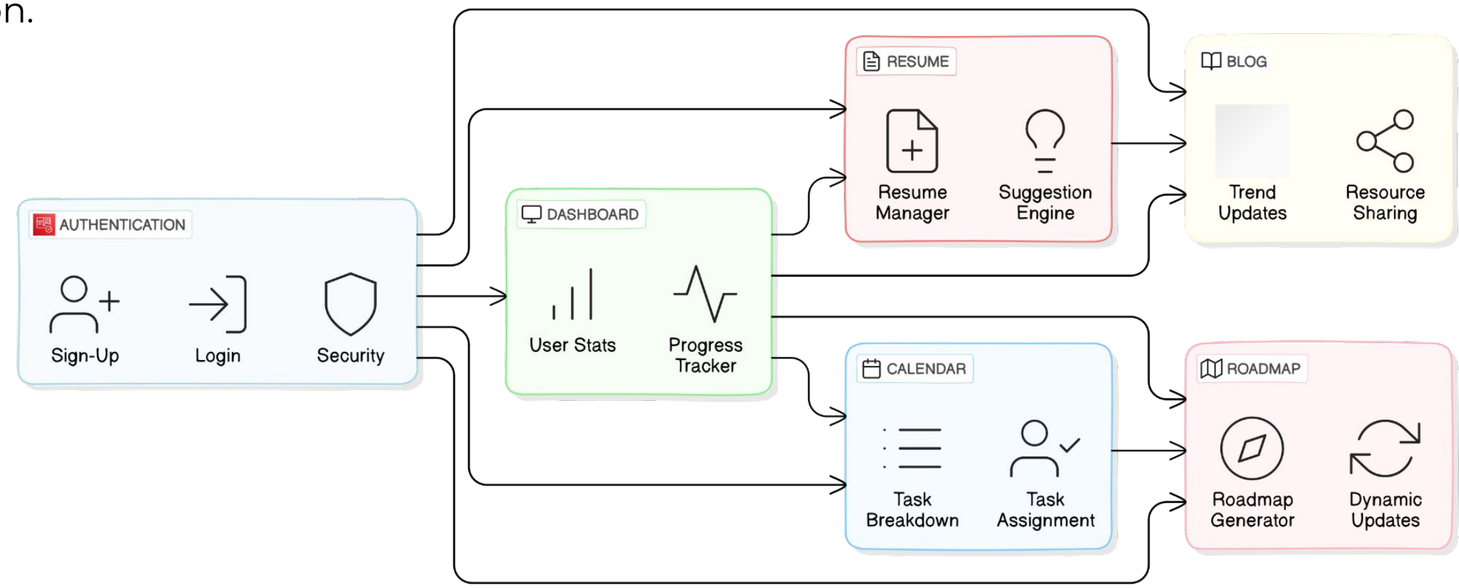
If you're using any cloud solutions, mention details about integration

1. **AWS EC2:** For deploying the application.
2. **AWS S3:** For storing user-generated content and resources.

Diagram: A modular diagram to show the different software modules and their functionalities.

What all software modules will be built?

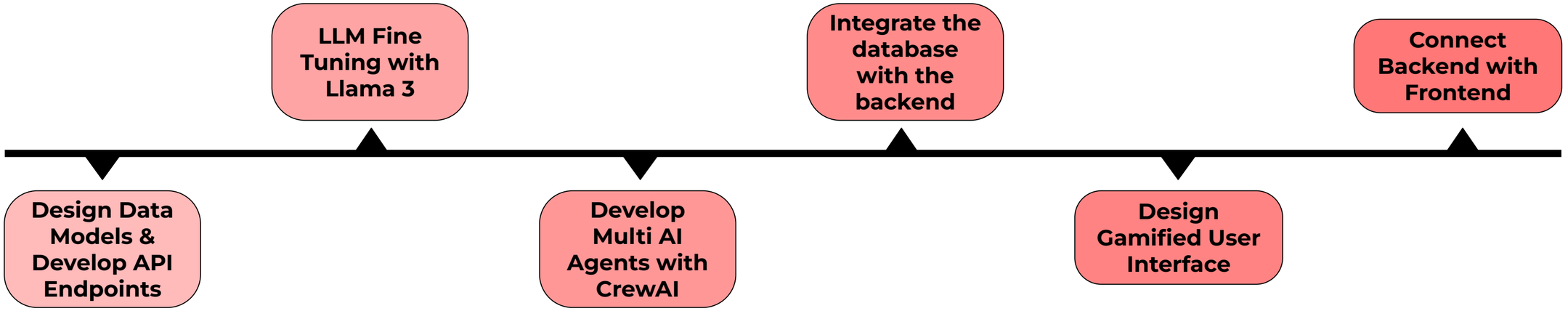
1. **User Authentication Module:** Handles sign-up, login, and secure access.
2. **Dashboard Module:** Displays user stats and progress.
3. **Resume Module:** Manages and suggests improvements for user resumes.
4. **Calendar Module:** Breaks down tasks and assigns them to the user.
5. **Blog Module:** Updates users with the latest trends, courses, and resources.
6. **Roadmap Module:** Generates and dynamically updates personalized career roadmaps.



Execution plan

What will be the steps from the drawing board to the actual prototype ?

- **Requirement Gathering:** Identify and document all **functional** and **non-functional** requirements.
- **Design Phase:** Create wireframes and design the UI/UX.
- **Development Phase:**



- **Testing Phase:** Conduct thorough Unit & Integration testing to ensure functionality, performance, and security.
- **Deployment Phase:** Deploy the application on cloud infrastructure and conduct user acceptance testing.
- **Iteration and Improvement:** Gather feedback, make necessary improvements, and iterate on the product features.