**# AI-Powered Smart Study Schedule Generator**

**Overview**

The Smart Study Schedule Generator is an AI-driven web application designed to create personalized study plans for students based on their study habits, subject preferences, course difficulty, and past performance. The system leverages **LangChain** with **Llama2-7B** to generate optimized schedules, balancing difficult subjects with available time, and provides AI-powered tutoring support for subject-specific guidance.

**Key Features**

1. **Dashboard with Study Schedule** – A centralized view of the generated study plan.
2. **Subject-wise Strength & Weakness Indicator** – Highlights subjects that need improvement.
3. **Google Calendar Sync** – Integrates the study schedule with Google Calendar.
4. **Progress Tracker** – Monitors study habits and completion rates.
5. **AI Tutor Chat** – Students can ask study-related questions and get AI-powered responses.
6. **LangChain Integration** – Uses Llama2-7B for personalized schedule generation.
7. **No Database Requirement** – All data processing is done on the client-side and API.

**Technology Stack**

* **Frontend**: React, Next.js, HTML
* **Backend**: Nodejs, Flask (Python)
* **AI & NLP**: LangChain, Llama2-7B
* **UI/UX**: CSS, Figma (for design planning)
* **Integration**: Google Calendar API

**How It Works**

1. **User Inputs Preferences** – Students provide details on available study hours, subject priorities, and past performance.
2. **AI Generates Study Plan** – LangChain processes the input and generates a balanced schedule.
3. **Dashboard Displays Plan** – The personalized study plan is presented to the user.
4. **Google Calendar Sync** – Users can add study sessions to their Google Calendar.
5. **AI Tutor Assistance** – Students can chat with the AI tutor for study guidance.
6. **Progress Tracking** – System updates the user’s progress based on study completion.

**Development Plan (24-Hour Hackathon)**

**Phase 1: Planning (Hour 1-2)**

* Define core features and finalize tech stack.
* Assign roles to team members.
* Sketch UI wireframes and flow diagrams.

**Phase 2: Backend Development (Hour 3-5)**

* Set up Flask backend with API endpoints.
* Integrate LangChain and Llama2-7B for schedule generation.
* Develop AI Tutor chat functionality.

**Phase 3: Frontend Development (Hour 6-8)**

* Implement React/Next.js UI components.
* Build study schedule display and user input forms.
* Create Google Calendar Sync button.

**Phase 4: Full-Stack Integration (Hour 9-12)**

* Connect frontend with backend API.
* Test API requests for schedule generation and AI responses.

**Phase 5: Testing & Debugging (Hour 13-16)**

* Identify and fix bugs in API calls and UI components.
* Ensure mobile responsiveness.

**Phase 6: Enhancements & Polish (Hour 17-20)**

* Improve UI/UX for better user experience.
* Optimize API response time.
* Finalize progress tracker.

**Phase 7: Final Testing & Presentation (Hour 21-24)**

* Perform final testing and fix any last-minute issues.
* Prepare demo and pitch.
* Deploy project (if applicable) and showcase results.

**Conclusion**

This AI-powered Smart Study Schedule Generator enhances student productivity by providing an optimized study plan tailored to individual needs. By integrating **LangChain**, **Llama2-7B**, and **Google Calendar Sync**, it offers a seamless and interactive study planning experience.

📝 Explanation of Flow:

1️⃣ Landing Page → User clicks Start Planning

2️⃣ Dashboard → Displays study plan & progress

3️⃣ User Inputs Preferences → (Subjects, Time, Goals)

4️⃣ AI Generates Study Plan (Using LangChain & Llama2-7B)

5️⃣ Personalized Study Schedule Appears

6️⃣ Google Calendar Sync & Progress Tracker Updates

7️⃣ AI Tutor Chat → Provides subject-wise guidance

8️⃣ User Studies & Progress Updates

**📌 UI/UX Design for Smart Study Planner**

Since this is a **hackathon project**, the **UI/UX** should be **clean, minimal, and intuitive** while ensuring easy navigation and **quick access to AI-powered features**.

**🎨 Design Principles**

✅ **Simple & Focused** → No clutter, clear sections for study plans, progress, and AI assistance.  
✅ **Dark & Light Mode** → Keep it visually appealing for long study sessions.  
✅ **Minimal Input, Maximum Output** → User should input preferences in a few clicks, and AI should generate a **ready-to-use** study schedule.  
✅ **Mobile & Web-Friendly** → Responsive design for students to check their schedules **on-the-go**.

**📌 UI Wireframe Breakdown**

**📍 1. Landing Page (Home)**

**🔹 Goal:** Introduce the app & let users quickly start planning.  
**🔹 Elements:**

* ✨ App Name + Catchy Tagline
* 📌 "Start Planning" CTA Button
* 📜 Short explanation of how the AI planner works

🎨 **Example UI:**

**"Master Your Study Time with AI! 🚀"**  
🔘 Start Planning (Button)

**📍 2. Dashboard Page**

**🔹 Goal:** Show the **AI-generated study plan** + **progress tracking**  
**🔹 Elements:**

* 📅 **Personalized Study Schedule** (Week View)
* 🟢 **Subject Strengths & Weaknesses** (Graph or Progress Bar)
* 🎯 **Study Goal Summary** (Cards with key milestones)
* 🔗 **Google Calendar Sync Button**
* 🎙️ **Ask AI Tutor (Chat Icon on Corner)**

🎨 **Example Layout:**

sql

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| 📅 Study Schedule (Week View) |

|------------------------------------|

| 📊 Subject Analysis (Graph) |

|------------------------------------|

| 🔗 Sync with Google Calendar |

| 🎙️ Chat with AI Tutor |

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**"Today’s Plan: 2 Hours of Math, 1 Hour of History."** ✅

**📍 3. Study Plan Customization (AI Input)**

**🔹 Goal:** Let users **adjust preferences** for AI to generate a schedule.  
**🔹 Elements:**

* 🏆 **Goal Selection** → "Improve Math" | "Score 90+ in Exams" | "Balanced Learning"
* ⏳ **Time Availability** → Drag slider (1-5 hours/day)
* 📚 **Subjects** → Checkboxes (Math, Science, English, etc.)
* 🔍 **Focus Area** → Dropdown (Past performance, Subject difficulty, Custom)
* 🔘 **"Generate Plan" Button** → Calls **LangChain API**

🎨 **Example UI:**

yaml

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📚 Select Subjects: ✅ Math ✅ Science ✅ History

⏳ Time Available: [ 3 Hours ] (Slider)

🏆 Goal: 🎯 Balanced Learning 🔘 Exam Focus

🔘 Generate AI Plan (Button)

**📍 4. AI Tutor Chat Page**

**🔹 Goal:** Let students ask AI questions about **study techniques** & **subject explanations**  
**🔹 Elements:**

* 💬 Chat Interface (Minimalistic)
* 🎙️ **"Ask Me Anything" Placeholder**
* 📖 Context-Aware Responses (Uses past grades & preferences)
* 🔄 Suggested Prompts (E.g., **"How do I improve in Physics?"**)

🎨 **Example UI:**

sql

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🧠 AI Tutor: "Need help with a subject? Ask me!"

💬 User: "How can I study Chemistry more effectively?"

🧠 AI: "Focus on visual mnemonics for elements. Would you like a custom flashcard set?"

**📌 Summary**

1️⃣ **Landing Page** → Quick Start  
2️⃣ **Dashboard** → AI-Generated Study Plan & Progress Tracker  
3️⃣ **Study Plan Customization** → User Inputs for AI  
4️⃣ **AI Tutor Chat** → Subject-Wise Study Guidance

🔥 **Next Steps:**

* Do you want a **Figma design** for the UI?
* Need **a React component structure** for faster development?

**📌 Project Plan: AI Smart Study Planner**

**Tech Stack**

✅ **Frontend** → React + Next.js + TailwindCSS  
✅ **Backend** → Flask (FastAPI is an alternative)  
✅ **AI** → LangChain + Llama2-7B (for generating schedules)  
✅ **ML & NLP** → Scikit-learn (subject difficulty analysis)  
✅ **Calendar Sync** → Google Calendar API  
✅ **State Management** → Local Storage (since no database)

**📌 Features & Implementation Plan**

| **Feature** | **Implementation** |
| --- | --- |
| **📊 Dashboard with Study Schedule** | React-based UI displaying AI-generated schedules |
| **📈 Subject Strength/Weakness Indicator** | Analyze grades & study habits to provide insights |
| **📅 Google Calendar Sync** | Use Google Calendar API to sync study sessions |
| **📉 Progress Tracker** | Store progress in localStorage & update dynamically |
| **🧠 LLM-powered Timetable Generator** | LangChain + Llama2-7B to generate study plans |
| **💬 AI Study Assistant** | Chatbot using LangChain memory for tutoring |

**📌 System Flow**

1️⃣ **User Inputs Study Preferences** (Subjects, Time Availability, Difficulty, Goals)  
2️⃣ **Llama2-7B Generates a Personalized Study Plan**  
3️⃣ **React Dashboard Displays Schedule** (Timetable, Strengths/Weaknesses)  
4️⃣ **User Syncs with Google Calendar** (Optional)  
5️⃣ **User Chats with AI Tutor** for Subject-Wise Guidance  
6️⃣ **Progress Updates in Local Storage**

**📌 Folder Structure**

perl

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smart-study-planner/

├── frontend/ (React + Next.js)

│ ├── components/

│ ├── pages/

│ ├── styles/

│ └── utils/

│

├── backend/ (Flask + LangChain)

│ ├── models/ # ML/NLP scripts

│ ├── routes/ # API endpoints

│ ├── langchain/ # Llama2-7B integration

│ ├── utils/ # Timetable generation logic

│ ├── app.py # Flask main file

│

├── google\_calendar/ (API integration)

├── requirements.txt

├── package.json

├── README.md

**📌 Next Steps**

* 🚀 Want a **sample LangChain script** for timetable generation?
* 🎨 Need **UI wireframes** for the dashboard?
* 🔗 Should we integrate a **Google OAuth flow** for calendar sync?

Let me know where you'd like to start! 🚀🔥