**Hackathon Project Phases Template** for the **AutoSage App** project.

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# Hackathon Project Phases Template

## Project Title:

**AutoSage App Using Gemini Flash**

## Team Name:

(Provide your team's name)

## Team Members:

- Member 1
- Member 2
- Member 3
- Member 4

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## Phase-1: Brainstorming & Ideation

### Objective:

Develop an AI-powered vehicle expert tool using Gemini Flash to help users compare and analyze vehicle specifications, reviews, and eco-friendly options.

### Key Points:

1. **Problem Statement:**
    - Many users struggle to find reliable, up-to-date information about two-wheelers and four-wheelers before making a purchase decision.
    - Users also need guidance on vehicle maintenance and eco-friendly vehicle choices.

2. **Proposed Solution:**
    - An AI-powered application using **Gemini Flash** to provide **real-time vehicle specifications, reviews, and comparisons.**
    - The app offers **maintenance tips** and **eco-friendly vehicle insights** based on user preferences.
3. **Target Users:**
    - **Vehicle buyers** looking for specifications and comparisons.
    - **Vehicle owners** needing seasonal maintenance tips.
    - **Eco-conscious consumers** searching for hybrid and electric vehicle options.
4. **Expected Outcome:**
    - A functional **AI-powered vehicle information app** that provides insights based on real-time data and user queries.

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# Phase-2: Requirement Analysis

## Objective:

Define the technical and functional requirements for the AutoSage App.

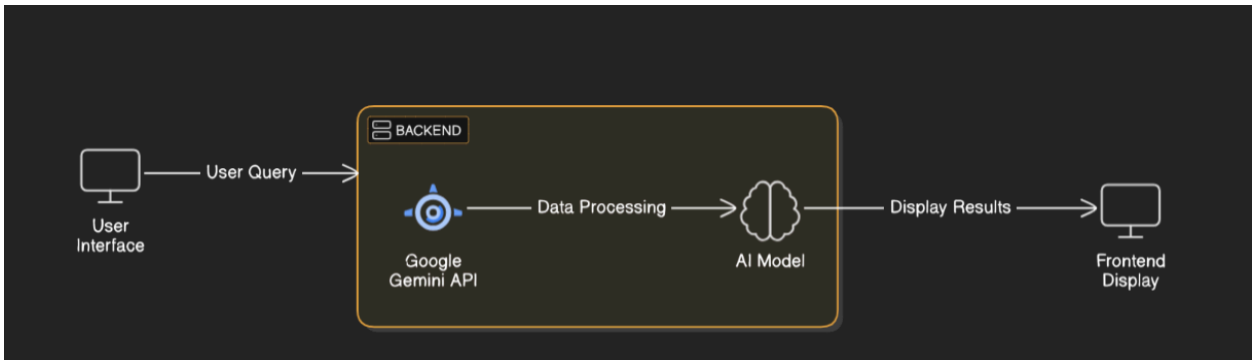
## Key Points:

1. **Technical Requirements:**
    - Programming Language: **Python**
    - Backend: **Google Gemini Flash API**
    - Frontend: **Streamlit Web Framework**
    - Database: **Not required initially (API-based queries)**
2. **Functional Requirements:**
    - Ability to **fetch vehicle details** using Gemini Flash API.
    - Display **specifications, reviews, and comparisons** in an intuitive UI.
    - Provide **real-time vehicle maintenance tips** based on seasons.
    - Allow users to **search eco-friendly vehicles** based on emissions and incentives.
3. **Constraints & Challenges:**
    - Ensuring real-time updates from **Gemini API**.
    - Handling **API rate limits** and optimizing API calls.
    - Providing a **smooth UI experience** with Streamlit.

# Phase-3: Project Design

## Objective:

Develop the architecture and user flow of the application.




## Key Points:

1. **System Architecture:**
    - User enters vehicle-related query via UI.
    - Query is processed using **Google Gemini API**.
    - AI model fetches and processes the data.
    - The frontend displays **vehicle details, reviews, and comparisons**.
2. **User Flow:**
    - Step 1: User enters a query (e.g., "Best motorcycles under ₹1 lakh").
    - Step 2: The backend **calls the Gemini Flash API** to retrieve vehicle data.
    - Step 3: The app processes the data and **displays results** in an easy-to-read format.
3. **UI/UX Considerations:**
    - **Minimalist, user-friendly interface** for seamless navigation.
    - **Filters for price, mileage, and features**.
    - **Dark & light mode** for better user experience.

# Phase-4: Project Planning (Agile Methodologies)

## Objective:

Break down development tasks for efficient completion.

| Sprint | Task | Priority | Duration | Deadline | Assigned To | Dependencies | Expected Outcome |
|---|---|---|---|---|---|---|---|
| Sprint 1 | Environment Setup & API Integration | 🔴 High | 6 hours (Day 1) | End of Day 1 | Member 1 | Google API Key, Python, Streamlit setup | API connection established & working |
| Sprint 1 | Frontend UI Development | 🟡 Medium | 2 hours (Day 1) | End of Day 1 | Member 2 | API response format finalized | Basic UI with input fields |
| Sprint 2 | Vehicle Search & Comparison | 🔴 High | 3 hours (Day 2) | Mid-Day 2 | Member 1& 2 | API response, UI elements ready | Search functionality with filters |
| Sprint 2 | Error Handling & Debugging | 🔴 High | 1.5 hours (Day 2) | Mid-Day 2 | Member 1&4 | API logs, UI inputs | Improved API stability |
| Sprint 3 | Testing & UI Enhancements | 🟡 Medium | 1.5 hours (Day 2) | Mid-Day 2 | Member 2& 3 | API response, UI layout completed | Responsive UI, better user experience |
| Sprint 3 | Final Presentation & Deployment | 🟢 Low | 1 hour (Day 2) | End of Day 2 | Entire Team | Working prototype | Demo-ready project |

## Sprint Planning with Priorities

## Sprint 1 – Setup & Integration (Day 1)

(🔴 **High Priority)** Set up the **environment** & install dependencies.
(🔴 **High Priority)** Integrate **Google Gemini API**.
(🟡 **Medium Priority)** Build a **basic UI with input fields**.

## Sprint 2 – Core Features & Debugging (Day 2)

(🔴 **High Priority)** Implement **search & comparison functionalities**.
(🔴 **High Priority)** Debug API issues & handle **errors in queries**.

## Sprint 3 – Testing, Enhancements & Submission (Day 2)

(🟡 **Medium Priority)** Test API responses, refine UI, & fix UI bugs.
(🟢 **Low Priority)** Final **demo preparation & deployment**.

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# Phase-5: Project Development

## Objective:

Implement core features of the AutoSage App.

## Key Points:

1. **Technology Stack Used:**
    - **Frontend:** Streamlit
    - **Backend:** Google Gemini Flash API
    - **Programming Language:** Python
2. **Development Process:**
    - Implement **API key authentication** and **Gemini API integration**.
    - Develop **vehicle comparison and maintenance tips logic**.
    - Optimize **search queries for performance and relevance**.
3. **Challenges & Fixes:**
    - **Challenge:** Delayed API response times.
      **Fix:** Implement **caching** to store frequently queried results.
    - **Challenge:** Limited API calls per minute.
      **Fix:** Optimize queries to fetch **only necessary data**.

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# Phase-6: Functional & Performance Testing

## Objective:

Ensure that the AutoSage App works as expected.

| Test Case ID | Category | Test Scenario | Expected Outcome | Status | Tester |
|---|---|---|---|---|---|
| TC-001 | Functional Testing | Query "Best budget cars under ₹10 lakh" | Relevant budget cars should be displayed. | ✅ Passed | Tester 1 |
| TC-002 | Functional Testing | Query "Motorcycle maintenance tips for winter" | Seasonal tips should be provided. | ✅ Passed | Tester 2 |

| | | | | | |
|---|---|---|---|---|---|
| TC-003 | Performance Testing | API response time under 500ms | API should return results quickly. | ⚠ Needs Optimization | Tester 3 |
| TC-004 | Bug Fixes & Improvements | Fixed incorrect API responses. | Data accuracy should be improved. | ✅ Fixed | Developer |
| TC-005 | Final Validation | Ensure UI is responsive across devices. | UI should work on mobile & desktop. | ❌ Failed - UI broken on mobile | Tester 2 |
| TC-006 | Deployment Testing | Host the app using Streamlit Sharing | App should be accessible online. | 🚀 Deployed | DevOps |

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# Final Submission

1. **Project Report Based on the templates**
2. **Demo Video (3-5 Minutes)**
3. **GitHub/Code Repository Link**
4. **Presentation**