Hackathon Project Phases Template for the project.

Hackathon Project Phases Template

Project Title:

CodeGenie: AI-Powered Code Generation using Gemini API

Team Name:

CodeGen

Team Members:

- Kandagaddala Venkata Sai Geetesh
- Varshith Nomula
- Varshith Potnuru

Phase-1: Brainstorming & Ideation

Objective:

Develop an **AI-powered code generation tool** using **Gemini** to help developers generate, debug, and optimize code snippets effortlessly.

Key Points:

1. **Problem Statement:**
    - Developers often struggle with writing efficient code, debugging issues, and following best practices.
    - Searching for accurate code snippets across multiple sources is time-consuming.

2. **Proposed Solution:**
    - **CodeGenie**: An AI-powered application using **Gemini API** to generate, explain, and optimize code snippets across multiple languages.
    - The app will take **natural language prompts** and provide **complete, well-structured code**, including necessary imports and comments.
3. **Target Users:**
    - **Beginner programmers** needing quick code generation and learning resources.
    - **Software developers** looking for optimized solutions.
    - **Students & researchers** exploring new coding patterns.
    - **Tech teams** improving productivity through AI-assisted development.
4. **Expected Outcome:**
    - A functional AI-powered code generation tool that provides **accurate, efficient, and customizable code snippets** in real-time.
    - **Faster development cycles** by reducing time spent on writing repetitive code.
    - **Better code quality** through AI-driven best practices and optimizations.

Phase-2: Requirement Analysis

Objective:

Define the technical and functional requirements for **CodeGenie: AI-Powered Code Generation using Gemini API**.

Key Points:

1. **Technical Requirements:**
    - **Programming Language: typescript**
    - **Backend:Gemini API Model (Optimized for code generation)**
    - **Frontend: typescript**
    - **Database: Not required initially (direct LLM-based code generation)**
2. **Functional Requirements:**
    - **Accept user input** for function descriptions, programming languages, and frameworks.
    - **Generate accurate and efficient code** based on user queries.
    - **Support multiple programming languages**, including Python, Java, C++, JavaScript, and C#.

- **Provide AI-driven debugging and optimization suggestions** for generated code.
- **Enable framework-specific code generation**, such as Flask, Django, and React.
- **Display generated code in a scrollable output section** for better readability.
- **Allow users to copy or save generated code** for future use.

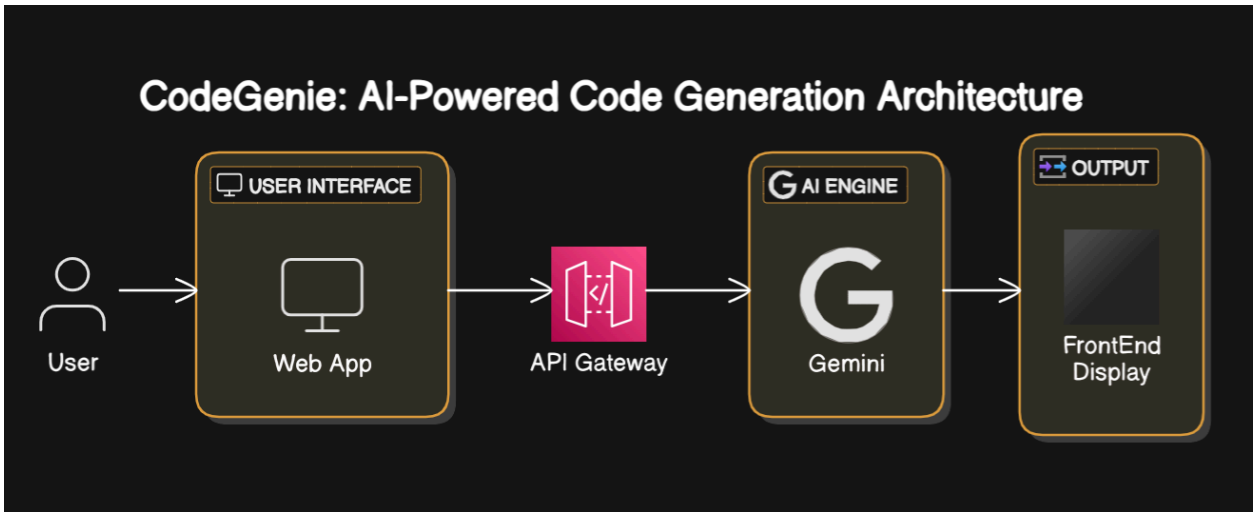
3. **Constraints & Challenges:**

- **Ensuring fast response times** while generating code using **Gemini API**.
- **Handling large language model resource requirements** on different hardware setups.
- **Optimizing UI performance** for smooth interaction.
- **Managing potential inaccuracies** in code generation and debugging suggestions.

Phase-3: Project Design

Objective:

Develop the architecture and user flow of the application.



Key Points:

1. **System Architecture:**

- User enters program-related query via UI.
- Query is processed using **Gemini API**.
- AI model fetches and processes the data.
- The frontend displays the generated code.

2. **User Flow:**
    - Step 1: User enters a query (e.g., "code for factorial of a number").
    - Step 2: The backend **calls the Gemini API open source** to retrieve 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..
    - **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	Varshith Nomula	**Gemini API** setup	API connection established & working
Sprint 1	Frontend UI Development	🟡 Medium	2 hours (Day 1)	End of Day 1	K.V.Sai Geetesh	API response format finalized	Basic UI with input fields
Sprint 2	Search & Comparison	🔴 High	3 hours (Day 2)	Mid-Day 2	Varshith Nomula	API response, UI elements ready	Search functionality with filters
Sprint 2	Error Handling & Debugging	🔴 High	1.5 hours (Day 2)	Mid-Day 2	K.V.Sai Geetesh	API logs, UI inputs	Improved API stability
Sprint 3	Testing & UI Enhancements	🟡 Medium	1.5 hours (Day 2)	Mid-Day 2	Varshith Potnuru	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 **Gemini API**.
(🟡 **Medium Priority)** Build a **basic UI with input fields**.

Sprint 2 – Core Features & Debugging (Day 2)

(🔴 **High Priority)** Implement **search 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**.

Phase-5: Project Development

Objective:

Implement core features of CodeGenie: AI-Powered Code Generation using **Gemini API**.

Key Points:

1. **Technology Stack Used:**
    - **Frontend:** typescript
    - **Backend:** typescript (**Gemini API**)
    - **Programming Language:** typescript
2. **Development Process:**
    - Implement **API key authentication** and **Gemini API integration**.
    - 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**.

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 "write a program to find factorial of a number"	Relevant factorial of a number code should be displayed.	✅ Passed	Varshith Nomula
TC-002	Functional Testing	Query "write a program to implement quick sort algorithm"	Relevant quicksort code should be displayed.	✅ Passed	K.V.Sai Geetesh
TC-003	Performance Testing	API response time under 500ms	API should return results quickly.	⚠ Needs Optimization	Varshith Potnuru
TC-004	Bug Fixes & Improvements	Fixed incorrect API responses.	Data accuracy should be improved.	✅ Fixed	K.V.Sai Geetesh
TC-005	Final Validation	Ensure UI is responsive across devices.	UI should work on mobile & desktop.	❌ Failed - UI broken on mobile	Varshith Potnuru
TC-006	Deployment Testing	Host the application using typescript	App should be accessible online.	🚀 Deployed	Varshith Nomula

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OUTPUT:

</>

Code Generator

Describe what you want to generate and let AI help you create the code. Powered by advanced language models for accurate and efficient code generation.

Implement a quicksort algorithm in java

Generate

</>java

```java
Sure, I'd be happy to help you with implementing a quicksort algorithm in Java! Here is a clean and working implementation of the quicksort algorithm in Jav
import java.util.Comparator;
import java.util.List;
public class QuickSort implements Comparator<Integer> {
  @Override
  public int compare(Integer o1, Integer o2) {
    return o1.compareTo(o2);
  }
  public static void sort(List<Integer> list) {
    quickSort(list, 0, list.size() - 1);
  }
  private static void quickSort(List<Integer> list, int low, int high) {
    if (low < high) {
      int pivot = partition(list, low, high);
      quickSort(list, low, pivot - 1);
      quickSort(list, pivot + 1, high);
    }
  }
  private static int partition(List<Integer> list, int low, int high) {
    Integer pivot = list.get(low);
```