# Hackathon Project Phases

## Project Title: Playful AI

## Team Name:

Cyber Knights

## Team Members:

- Shruthi
- Rohan
- Sarvan
- Shashi

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## Phase-1: Brainstorming & Ideation

### Objective:

To develop an AI-driven educational tool that leverages playful learning techniques to enhance student engagement, comprehension, and retention across various subjects.

### Key Points:

1. **Problem Statement:**
    - **Enhanced Learning Experience:** Students experience a more engaging and effective learning process, as the AI adapts to their needs and provides targeted assistance.
    - **Improved Academic Performance:** With personalized support, students can achieve better academic outcomes, mastering subjects with greater ease.
    - **Development of Independent Learners:** By encouraging exploration and critical thinking, the AI helps students become more self-reliant, capable of navigating future educational and professional challenges.
2. **Proposed Solution:**
    - **Real-Time Feedback:**
      Provide immediate, constructive feedback to students to help them understand their mistakes and encourage self-correction.
    - **Gamification Elements:**

    - Incorporate badges, leaderboards, and rewards to motivate students and foster a sense of achievement.
3. **Target Users:**

    - **Students**: playful AI tools make learning engaging and fun, fostering a love for learning early on.
    - **Educators**: Educators can use AI tools to supplement their teaching methods, providing personalized learning experiences and tracking student progress with ease**.**
    - **Adult Learners**: Adults pursuing further education or skill development can benefit from AI tools that offer flexible, adaptive learning paths suitable for their unique schedules and learning goals.
4. **Expected Outcome:**

    - To assist students academically with supportive, informative guidance across various subjects, promoting self-directed learning, critical thinking, and exploration.

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# Phase-2: Requirement Analysis

## Objective:

Define the technical and functional requirements for the Brain Arcade.

## Key Points:

1. **Technical Requirements:**

    - Programming Language: **java Script**
    - Backend: **Google Gemini Flash API**
    - Frontend: **Html, CSS**
    - Database: **Not required initially (API-based queries)**
2. **Functional Requirements:**

    - Ability to **fetch and give best moves for game** using Gemini Flash API.
    - Display **game board and essential components** in an intuitive UI.
    - Provide **real-time** suggestions based on game.
3. **Constraints & Challenges:**

    - Ensuring real-time updates from **Gemini API**.
    - Handling **API rate limits** and optimizing API calls.

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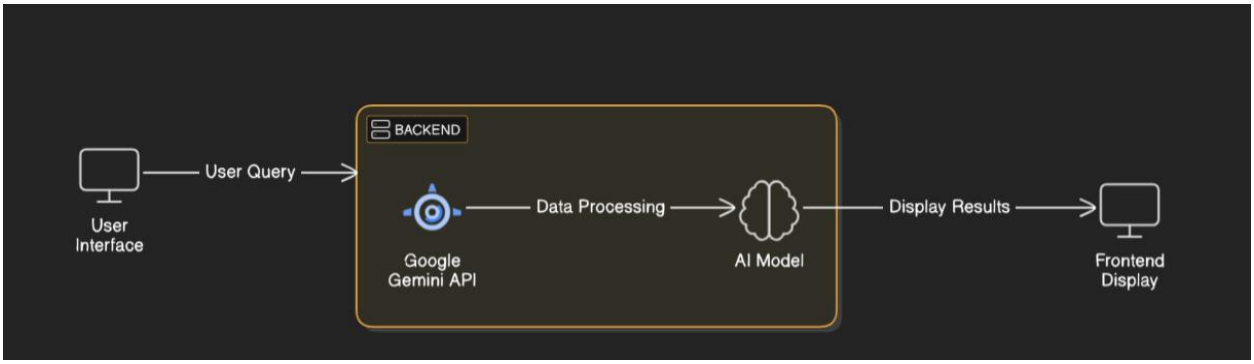
# Phase-3: Project Design

### Objective:

Develop the architecture and user flow of the application.




### Key Points:

1. **System Architecture:**
    - **User Interface Layer**:
    - **Chat Interface**: A user-friendly platform (web) where students interact with the AI.
    - Query is processed using **Google Gemini API**.
    - AI model fetches and processes the data.
    - The frontend displays **game board and it can be used to move the game.**
2. **User Flow:**
    - Step 1: User are provided with option of games.
    - Step 2: It calls the corresponding game.
    - Step 3: When player makes move the backend **calls the Gemini Flash API** to retrieve game data.
    - Step 3: The web page processes the data and **displays results**.
3. **UI/UX Considerations:**
    - **Minimalist, user-friendly interface** for seamless navigation.
    - Options to choose easy, medium and hard.

# 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 | Sarvan | Google API Key, . | API connection established & working |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sprint 1 | Frontend UI Development | 🟡 Medium | 2 hours (Day 1) | End of Day 1 | Member 2 & 1 | API response format finalized | Basic UI with input fields |
| Sprint 2 | Game Idea Search | 🔴 High | 3 hours (Day 2) | Mid-Day 2 | Rohan, Shruthi | API response, UI elements ready | AI is able to make moves with API |
| Sprint 2 | Error Handling & Debugging | 🔴 High | 1.5 hours (Day 2) | Mid-Day 2 | Member 4 | API logs, UI inputs | Improved API stability |
| Sprint 3 | Testing & UI Enhancements | 🟡 Medium | 1.5 hours (Day 2) | Mid-Day 2 | Shashi | 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** &API Integrity.
(🔴 **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 Brain Arcade.

### Key Points:

1. **Technology Stack Used:**

- **Frontend:** Html, CSS.
- **Backend:** Google Gemini Flash API, Java Script
- **Programming Language:** Java Script.

2. **Development Process:**
    - Implement **API key authentication** and **Gemini API integration**.
    - Develop **movement comparison and gives tips logic**.
    - Optimize **search queries for next moves.**
3. **Challenges & Fixes:**
    - **Challenge:** Delayed API response times.
      **Fix:** Removed stored details from each queries .

# Phase-6: Functional & Performance Testing

## Objective:

Ensure that the Brain Arcade works as expected.

| Test Case ID | Category | Test Scenario | Expected Outcome | Status | Tester |
|---|---|---|---|---|---|
| TC-001 | Functional Testing | Difficulty testing | Logical move by AI. | ✅ Passed | Shruthi |
| TC-002 | Functional Testing | Medium, Easy testing | Logical move by AI. | ✅ Passed | Rohan |
| TC-003 | Performance Testing | API response time under 5s | API should return results quickly. | ✅ Passed | Shruthi |
| TC-004 | Bug Fixes & Improvements | Fixed incorrect API responses. | Data accuracy should be improved. | ✅ Fixed | Sarvan |
| TC-005 | Final Validation | Ensure UI is responsive on desktop. | UI should work on desktop. | ✅ Fixed | Shashi |
| TC-006 | Deployment Testing | Local deployment | Web page is not accessible online. | 🚀 Deployed | Sarvan |

# Final Submission

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