AI LAB (CS39002) PROJECT REPORT

on

"Cric AI – *A fusion of Cricket* "

Submitted to
KIIT Deemed to be University

In Partial Fulfilment of the Requirement for the Award of

BACHELOR'S DEGREE IN COMPUTER SCIENCE

BY

AAYUSH BHARUKA   2205002

AYUSH LOHIA   2205025

UNDER THE GUIDANCE OF
Dr.SRICHETA PARUI

SCHOOL OF COMPUTER ENGINEERING
KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY
BHUBANESWAR, ODISHA - 751024
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KIIT Deemed to be University

School of Computer Engineering
Bhubaneswar, ODISHA 751024

CERTIFICATE

This is certify that the project entitled

"CRIC AI"

submitted by

AAYUSH BHARUKA   2205002
AYUSH LOHIA   2205025

This is to certify that the project entitled CRIC AI submitted by Aayush Bharuka (2205002) and Ayush Lohia(2205025) is a record of bonafide work carried out by them, in partial fulfilment of the requirement for the award of the degree of Bachelor of Technology (Computer Science & Engineering) at KIIT Deemed to be University, Bhubaneswar. This work was conducted during the academic year 2024-2025 under my guidance.

Date:24/03/2025

Dr.Sricheta Parui
Project Guide

Acknowledgements

ABSTRACT

Hand Cricket is a popular childhood game that has been digitized in this project. The AI-Powered Hand Cricket Web Game simulates the traditional hand cricket experience where a player competes against an AI opponent.

The game includes:

- **Toss system** (Heads/Tails) where the winner chooses to bat or bowl.
- **Two innings**: One sets a target, and the other chases it.
- **AI-powered opponent** that makes random moves.
- **Flask-based backend** and **JavaScript-based UI** for smooth gameplay.

Keywords: Hand Cricket, Web Game, Flask, AI Opponent, Two Innings, Interactive UI.

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Chapter 1

Introduction

Hand Cricket is a simplified version of cricket played using fingers. This project aims to bring this nostalgic game to the digital space, where a user competes against an AI-powered opponent in a turn-based format.

Project Highlights:

- Built using Flask (Python) for backend and HTML/CSS/JavaScript for frontend.
- AI opponent randomly selects numbers (1-6).
- Toss mechanism to determine the batting/bowling order.
- Two innings to set and chase a target.
- Interactive UI for a smooth experience.

This project addresses the need for lightweight browser-based cricket games that are simple yet engaging.

Chapter 2

Basic Concepts/ Literature Review

2.1 Basic Concepts

The Hand Cricket Web Game is built on client-server architecture, where the frontend (browser) interacts with the backend (server) to process game logic. The key components include:

- **Flask (Python):** Handles game state, API communication, and AI move generation.
- **HTML, CSS, JavaScript:** Creates an interactive user interface and manages real-time updates.
- **Random Number Generation:** Simulates AI's decision-making by choosing numbers between 1-6.
- **State Management:** Tracks innings, scores, and turns to ensure smooth game progression.

2.2 Literature Review

Existing online cricket games are often graphically intensive and complex, requiring high system resources. This project aims to provide a lightweight alternative that is simple, web-based, and quick to play.

Relevant studies highlight the importance of:

- **Artificial Intelligence in Games:** Research in AI-driven game opponents suggests that even basic randomization can create engaging experiences.
- **Game Development Standards:** Following structured software engineering principles ensures reliability and scalability.

Chapter 3

Problem Statement / Requirement Specifications

There is a lack of simple, AI-driven hand cricket games available on the web. This project aims to bridge that gap by offering a fun, browser-based hand cricket experience.

3.1 Project Planning

Write about the steps to be followed while planning to execute the project development. It can be represented using list of requirements of the user or features to be developed.

3.2 Requirement Specifications (SRS)

Functional Requirements:

- The game should allow a player vs. AI match.
- The toss winner should choose to bat or bowl first.
- Two innings: First sets a target, second chases it.
- AI should generate random numbers for fairness.

3.3 Project Analysis

Before implementation, a detailed analysis was conducted to ensure the feasibility and efficiency of the project:

Feasibility Study:
1. The game logic was examined to ensure smooth implementation .
2. AI behavior was defined as random selection (1-6), avoiding complex decision-making.

Potential Challenges & Solutions:
1. Handling user input & AI response → Used AJAX requests for smooth interaction between frontend and backend.
2. Ensuring fairness in AI moves → AI generates numbers randomly to mimic real gameplay.
3. Game flow management (Toss, Innings, Game End) → Implemented state management in Flask to track turns and scores.

User Experience Considerations:
1. Animations & color themes were chosen to enhance engagement.

Chapter 4

Implementation

In this section, present the implementation done by you during the project development.

4.1 Methodology OR Proposal

1) Backend Development (Flask): Implemented game logic, state management, and API endpoints for communication.
2) Frontend Development (HTML): Designed an interactive UI and used JavaScript for real-time gameplay updates.
3) AI Logic: Used random number generation (1-6) for AI moves to ensure fairness.
4) Testing & Optimization: Conducted unit testing, manual testing, and optimized performance for a smooth user experience.

4.2 Testing OR Verification Plan

Test ID	Test Case	Input	Expected Outcome	Status
T01	Toss	Heads/Tails	Displays winner	✓
T02	Bat First	3 (player), 5 (AI)	Score 3 runs	✓
T03	AI Wins Toss	AI chooses to bat	AI bats first	✓
T04	Match End	Player chases target	Game result displayed	✓

4.3 Result Analysis OR Screenshots
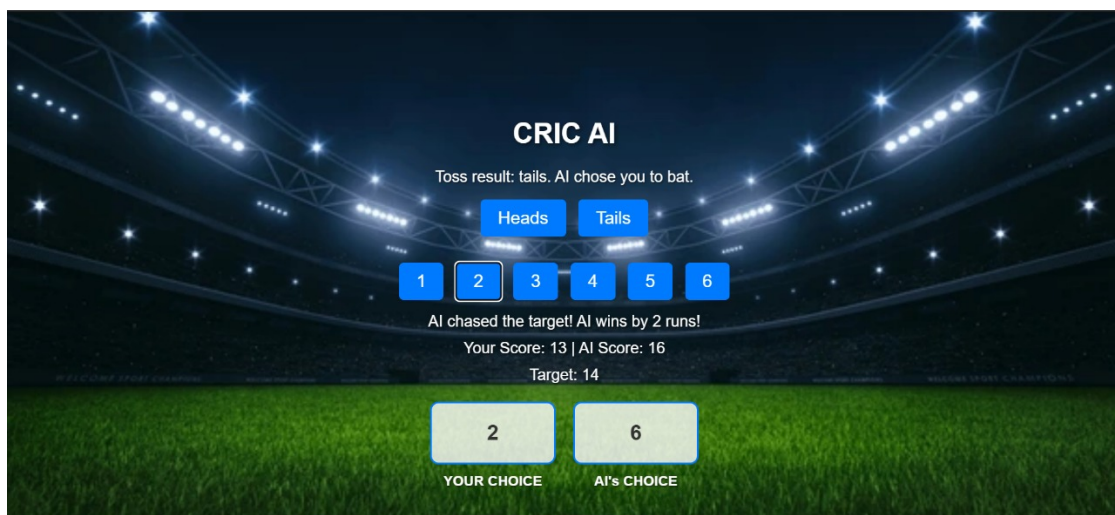
4.1 -final result shown

Chapter 5

Standards Adopted

5.1 Design Standards

- Used UML-based state management to track game flow (toss, innings, and turns).
- Ensured a responsive UI with standard web design practices.

5.2 Coding Standards

- Used modular coding with clear function responsibilities.
- Applied proper indentation, meaningful variable names, and comments for maintainability.

5.3 Testing Standards

- Performed manual gameplay testing to ensure fairness and smooth functionality.

Chapter 6

Conclusion and Future Scope

6.1 Conclusion

The AI-Powered Hand Cricket Web Game successfully brings hand cricket into the digital world. The game is engaging, easy to use, and provides an AI opponent for fun solo matches.

6.2 Future Scope

- AI Difficulty Levels: Implementing Reinforcement Learning (Q-Learning) to make AI smarter.
- Multiplayer Mode: Allowing two players to compete online.
- Leaderboard System: Tracking high scores.

References

1. Python Flask Documentation - https://flask.palletsprojects.com/
2. JavaScript Fetch API - https://developer.mozilla.org/en-US/docs/Web/API/Fetch_API
3. Machine Learning in Games - https://arxiv.org/abs/1909.04157

INDIVIDUAL CONTRIBUTION REPORT:

<CRIC AI>

<AAYUSH BHARUKA 2205002>
<AYUSH LOHIA 2205025>

Abstract: The Hand Cricket web game is a digital adaptation of the traditional hand cricket game played by children. The game is implemented as a Flask-based web application where the player competes against an AI opponent. The core functionalities include a toss system (heads/tails), two innings gameplay, run scoring, and AI-based random number selection. The project aims to provide an interactive and engaging web-based experience

Individual contribution and findings:

Aayush Bharuka

· Led half of the game development, focusing on AI strategies and logic implementation.

· Designed and developed GUI elements to enhance the user experience.

· Implemented AI-based random selection logic to ensure fair and unpredictable gameplay.

Ayush Lohia

· Managed the other half of game development, handling core game logic.

· Integrated game mechanics, including number selection and scoring systems.

· Contributed to project documentation, ensuring clarity and completeness in reporting.

Individual contribution to project report preparation:The report has been prepared collectively by both the students.

Individual contribution for project presentation and demonstration:The project presentation has been prepared collectively by both the students.

Full Signature of Supervisor: Full signature of the student:

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