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**COMSATS University, Islamabad Pakistan**

**Mancala Game**

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***Bachelor of Science in Software Engineering (2021-2025)***

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**COMSATS University, Islamabad Pakistan**

**Mancala Game**

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**In partial fulfillment**

**of the requirement for the degree of**

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# Introduction

Mancala is an ancient two-player board game that is believed to have originated in Africa. Mancala is typically played on a board with rows of pits or holes, with each player controlling one side. The objective of the game is to capture as many seeds or stones from your opponent's pits as possible and collect them in your own store, a larger pit on your side of the board. Mancala is a game of strategy and counting, and it has been enjoyed by people for centuries, making it a classic and enduring pastime.

## Vision Statement

**For** players **who** want to have a great ancient game experience. **The** ‘Mancala Game” **is a** game **that** provides ancient yet fun experience **unlike** other games that have gotten old and don’t appeal users anymore, **our** “Mancala Game” game provides a fairly user friendly and entertaining platform to interact and enjoy the game.

## Project Deliverables

* A game Prototype
* User Interface
* Vs AI game functionality

## System Limitations/Constraints

### Time Constraints

* Strict project timelines or deadlines.
* Limited development time

### User Experience Constraints

* Ensuring accessibility for players
* Design limitations related to the aesthetics of the game.

# Problem Definition

## Problem Statement

In the digital age, where convenience and accessibility are paramount, there is a growing demand for automating traditional board games to provide a engaging user experience. In today’s world, where every person is hinged on his phone and has no time for extensive board games and the maintenance they require yet they want to have fun playing retro games. People want to have all the fun minus the hassle.

## Proposed Solution

Our solution proposes an automated and digitalized version of Mancala game. Users can take on intelligent AI based computer player and challenge their intelligence. The implementation of AI based computer player will challenge user's strategy making and in action response, adaptability and reactive quickness, allowing users to take up challenge. This digitalized version not only encompasses historic richness and essence but also bridges gap between gen z and ancient values while teaching them important tactics used in daily life.

## Objectives of the Proposed System

* Develop an engaging and fun user interface
* Implement vs AI computer functionality
* Implement Mancala Rules
* Create Digital Mancala Game

## Scope

Scope of this project is to develop an intuitive and visually appealing user interface for the Mancala game, ensuring ease of use for players across different age groups. Ensure that the game logic and AI is compatible and running steadily. Implement standard Mancala gameplay mechanics, including the distribution of stones/seeds, capturing opponent's pieces, and collecting points in the player's store.

## Modules

### Module 1: Game Interface

Display a digital Mancala game board with 2 stores and several pits.

### Module 2: VS AI Functionality

Develop an intelligent AI algorithm that would challenge player.

### Module 3: Score Board

Maintain score board which will check number of stones in each pit and in store and will calculate them to crown a winner at the end.

# Requirement Analysis

## Functional Requirements

**Game Setup:**

* Players should be able to start a new game, selecting options such as board style and seed type.
* The game should allow customization of initial seed distribution rules.

**Gameplay:**

* Players must be able to make moves by selecting pits and distributing seeds.
* The game should enforce the rules of Mancala, including capturing opponent's seeds and ending the game when one side is empty.
* Players must be able to undo or replay moves as necessary.

**Single-Player Mode:**

* Implement an AI opponent with multiple difficulty levels for solo play.
* The AI should offer challenging gameplay and adapt to the player's skill level.

## Non-Functional Requirements

### Usability:

The game's user interface should be intuitive and easy to navigate for players of all skill levels.

### Reliability:

The game should be stable and reliable, minimizing the occurrence of crashes or unexpected errors during gameplay.