TIC TAC TOE GAME USING KOTLIN

### A PROJECT REPORT

***Submitted by***

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## BACHELOR OF ENGINEERING

***in***

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## RAJALAKSHMI ENGINEERING COLLEGE ANNA UNIVERSITY, CHENNAI

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## BONAFIDE CERTIFICATE

Certified that this Thesis titled **“Tic Tac Toe game using Kotlin**” is the bonafide work of “**MURSHID AHMED (2116210701171), MUHAMED JAZIL (2116210701168),**

**NARESH KUMAR (2116210701323)”** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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# ABSTRACT

This project presents the development of a Tic Tac Toe game application using Kotlin, a modern programming language that enhances productivity and safety for developers. The game implements the classic 3x3 grid format where two players, represented by 'X' and 'O', take turns marking the spaces in the grid. The primary objective is to align three of their symbols either horizontally, vertically, or diagonally. This application is designed to support both single-player and multiplayer modes, where single-player mode allows users to play against an AI opponent with adjustable difficulty levels. The development process leverages Kotlin’s robust features and Android Studio for the creation of a responsive and interactive user interface. Key functionalities include real-time game state management, turn validation, win/loss detection, and a reset mechanism to restart the game. Additionally, the application ensures an intuitive user experience with clear visual indicators and user-friendly controls.

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## MURSHID AHMED S MUHAMED JAZIL C NARESH KUMAR V

**CHAPTER 1 INTRODUCTION**

The Tic Tac Toe game, also known as Noughts and Crosses, is a simple yet enduring classic that has been enjoyed across generations. It is a game of strategy and skill where two players alternately mark the spaces in a 3x3 grid with their respective symbols, either 'X' or 'O'. The goal is to be the first to align three of their symbols in a row, whether horizontally, vertically, or diagonally. Despite its simplicity, the game offers a great deal of engagement and requires players to think ahead and plan their moves carefully. With the advent of modern technology, traditional games like Tic Tac Toe have found new life as digital applications, accessible on a variety of devices. This project focuses on the development of a Tic Tac Toe game using Kotlin, a statically typed programming language that runs on the Java Virtual Machine and is officially supported for Android development. Kotlin's modern features, including concise syntax, null safety, and seamless integration with existing Java code, make it an ideal choice for developing robust and maintainable applications. The primary objective of this project is to create an interactive and enjoyable Tic Tac Toe game that can be played on Android devices. The game is designed to support both single-player and multiplayer modes, allowing users to either play against an AI opponent with varying difficulty levels or challenge another human player. The application aims to provide a smooth and intuitive user experience, with clear visual cues and easy-to-use controls.

### PROBLEM STATEMENT

### The primary objective of this project is to create an interactive and enjoyable Tic Tac Toe game that can be played on Android devices. The game is designed to support both single-player and multiplayer modes, allowing users to either play against an AI opponent with varying difficulty levels or challenge another human player. The application aims to provide a smooth and intuitive user experience, with clear visual cues and easy-to-use controls. Robust error handling is necessary to manage unexpected inputs or situations, ensuring the game does not crash and provides meaningful error messages to the user. By addressing these challenges, the project aims to create a polished and engaging Tic Tac Toe game that leverages Kotlin's capabilities and provides a satisfying experience for users on Android devices.

### AIM AND OBJECTIVES OF THE PROJECT

The aim of this project is to develop a feature-rich, user-friendly Tic Tac Toe game for Android devices using Kotlin. This project seeks to deliver an engaging and intuitive gaming experience that supports both single-player and multiplayer modes. Objectives include implementing robust game logic to manage player turns, validate moves, detect win or draw conditions, and reset the game state. Designing an intuitive, visually appealing user interface that clearly indicates player turns, displays the game board, and provides options to start new games or switch game modes is crucial. Developing an AI opponent with adjustable difficulty levels to challenge players while ensuring fair gameplay is also a key objective. Additionally, ensuring the application is responsive and performs well across various Android devices, handling different screen sizes and orientations seamlessly, is prioritized. Writing clean, modular, and well-documented code adhering to Kotlin best practices to facilitate future enhancements is essential for long-term maintenance. Finally, providing a smooth user experience with clear feedback on user actions and robust error handling to prevent crashes and manage unexpected inputs effectively completes the objectives of this project.

### CHAPTER 5 RESULTS AND DISCUSSIONS

* 1. **OUTPUT**

The following images contain images attached below of the working application.

Example instance of creating a generation

**Fig 5.1: Output**

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### RESULT

The result of this project is a polished and feature-rich Tic Tac Toe game for Android devices, developed using Kotlin. The game offers a seamless and enjoyable experience for users, with support for both single-player and multiplayer modes. Robust game logic ensures accurate turn management, move validation, and win/draw detection. The intuitive user interface enhances accessibility, providing clear indications of player turns and game board status. An AI opponent with adjustable difficulty levels challenges players in single-player mode, contributing to an engaging gameplay experience. The application's responsiveness and performance across various Android devices, coupled with clean and well-documented Kotlin code, ensure maintainability and scalability for future enhancements. Overall, the project successfully delivers on its objectives, providing users with a visually appealing, responsive, and enjoyable Tic Tac Toe gaming experience on their Android devices.

**CHAPTER 6**

**CONCLUSION AND FUTURE ENHANCEMENT**

**6.1 CONCLUSION**

In conclusion, the developed Tic Tac Toe game presents a successful implementation of a feature-rich and user-friendly gaming experience for Android devices, utilizing Kotlin programming language. The project achieves its objectives by delivering robust game logic, an intuitive user interface, and responsive performance across various devices. The inclusion of both single-player and multiplayer modes, along with an adjustable AI opponent, ensures versatility and engagement for users.

For future enhancements, several avenues can be explored to further enrich the gaming experience. Integration of online multiplayer functionality would allow users to compete with friends or other players globally. Additional customization options, such as choosing different board sizes or alternative themes, could enhance user engagement and personalization. Implementing a comprehensive statistics tracking feature to record game outcomes and player performance would add depth to the gameplay experience. Furthermore, incorporating social sharing capabilities to share game results or challenges with friends on social media platforms could expand the game's reach and encourage social interaction among players. Overall, these enhancements would contribute to elevating the Tic Tac Toe game to new levels of enjoyment and interactivity.