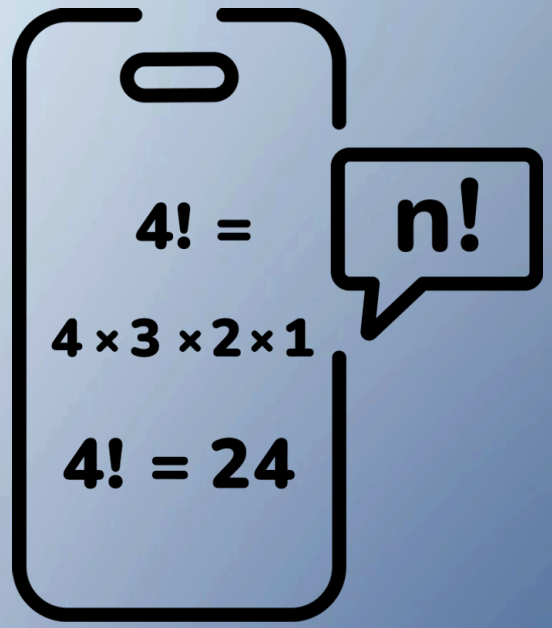
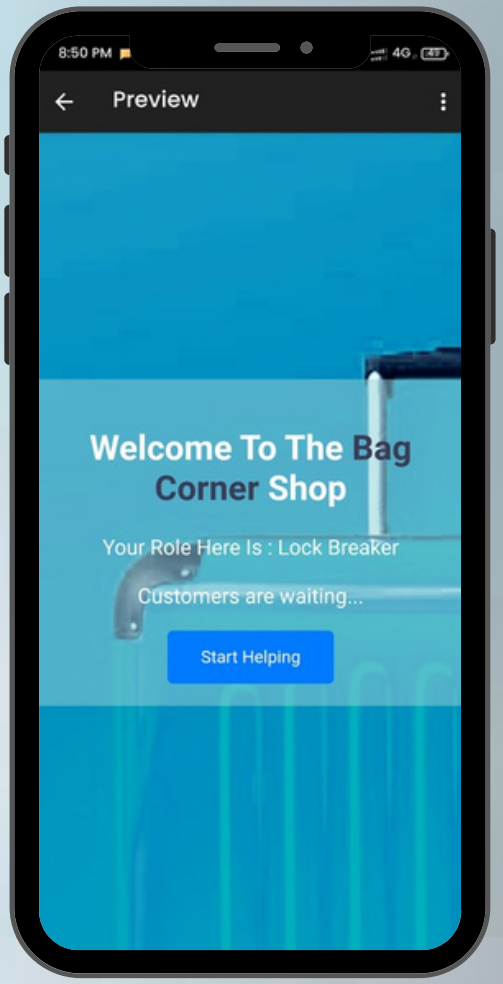
# Permutations and Combinations in Game Development

A Computational Science Fair Project



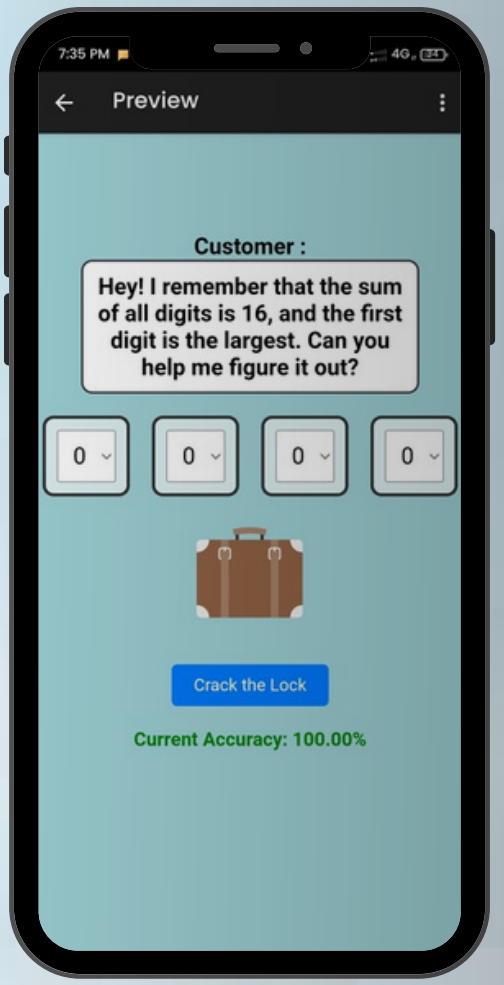
# Introduction

- This project demonstrates the use of computational techniques, specifically permutations and combinations, in game development.
- The project is based on a puzzle-solving game where players decode combinations using mathematical principles.



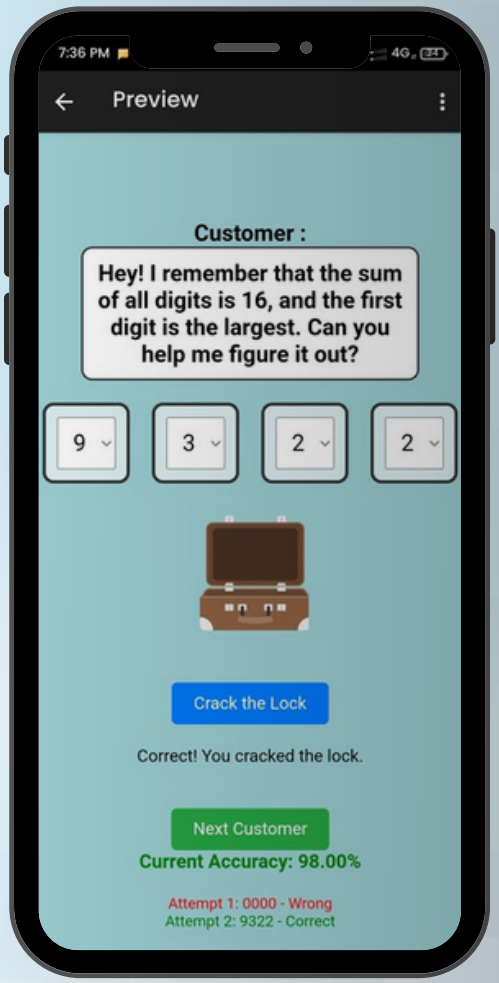
# Understanding Permutations and Combinations

- Permutations: Different ways to arrange a set of items.
- Example: Arranging digits 1, 2, and 3 in different orders (123, 132, etc.).
- Combinations: Selecting items from a set, order does not matter.
- Example: Choosing 2 items from a set of 3 (1, 2 or 1, 3).



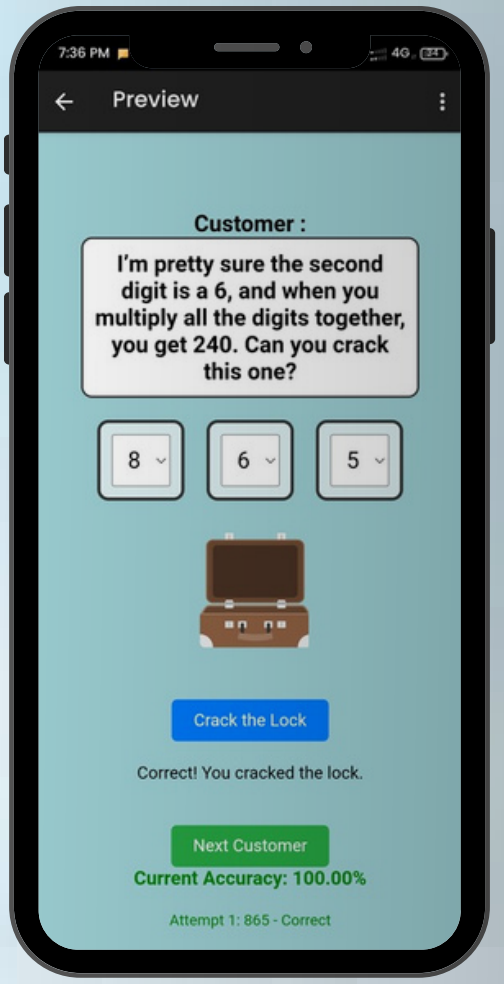
# Application in Game Development

- The game uses permutations to compute possible code combinations and combinations to calculate hints.
- Players are given hints such as the sum or product of digits and must use these clues to solve the puzzle.



# Game Logic Breakdown

- Each level provides hints based on mathematical properties like the sum, product, or largest digit.
- Players use combinations of digits and permutation calculations to arrive at the correct answer.



# Conclusion

- This project highlights the use of mathematical computations in a real-world scenario: game development.
- Permutations and combinations are used to create challenging puzzles, combining entertainment with mathematics.