

Dr. D. Y. Patil Pratishthan's College of Engineering

Salokhenagar, Kolhapur 2022-2023

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



A

PROJECT REPORT

ON

"Sudoku Game"

Submitted by:

Name	Roll No.	
Miss. Anuja Avinash Jasud	118	
Miss. Madhavi Mukund Choudhari	106	
Miss. Aparna Sarjerao Patil	141	
Mr. Varun Mahesh Kupte	126	

Under the Guidance of

Prof. Rohit Raut

SHIVAJI UNIVERSITY, KOLHAPUR

Dr. D. Y. Patil Pratishthan's College of Engineering Salokhenagar, Kolhapur

2022-2023

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CERTIFICATE

Certified that the Project topic entitled "Sudoku Game" is a bonafide work by Miss. Madhavi Choudhari, Miss. Aparna Patil, Miss. Anuja Jasud and Mr. Varun Kupte in partial fulfillment for the Degree of Bachelor of Engineering award in the 8th Semester of the SHIVAJI UNIVERSITY, KOLHAPUR during the year 2022-2023. It is certified that all corrections/ suggestions indicated for Internal Assessment have been incorporated in the report deposited in the Department Library. The Project report has been approved as it satisfies the Academic requirement in respect of the Project work prescribed for a BACHELOR OF ENGINEERING DEGREE.

Prof. Rohit Raut

(Guide) Prof. Shivaleela Arlimatti Dr.S.D. Mane (H.O.D) (Principal)

EXAMINERS SIGNATURE WITH DATE

1.

2.

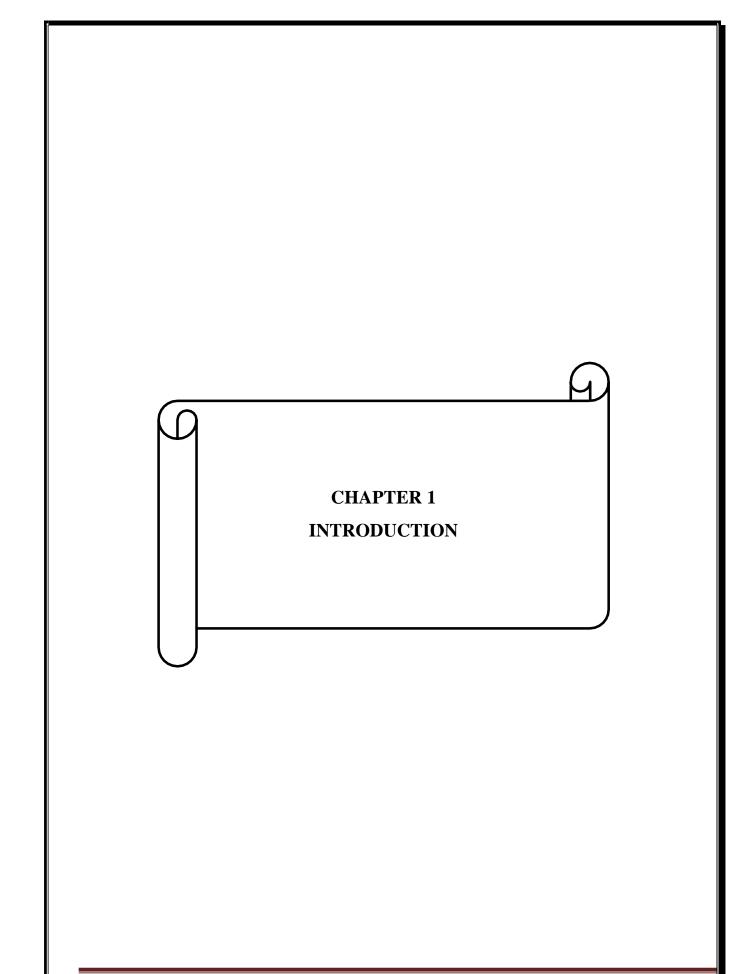
CONTENTS

I. INTRODUCTION
1.1 Introduction
2.1 Literature Survey
3. PROPOSED SYSTEM
3.1 Proposed System
4. SYSTEM ANALYSIS
4.1 Problem Statement
4.2 System Requirements
4.2.1 Software Requirements
4.2.2 Hardware Requirements
5. SYSTEM DESIGN
5.1 System Implementation
5.2 Snapshots
6. CONCLUSION7. REFERENCES

ABSTRACT

Sudoku Game: An Engaging Digital Adventure

- Sudoku Solver is an immersive and interactive digital game that brings the popular logic-based puzzle game Sudoku to life. This abstract outline the key features and objectives of the game, highlighting its captivating gameplay mechanics and engaging user experience.
- The core objective of Sudoku Solver is to complete Sudoku grids of varying difficulty levels, ranging from easy to expert. Players are presented with a 9x9 grid, subdivided into nine 3x3 subgrids, with several numbers already filled in. The challenge lies in filling the remaining cells with numbers from 1 to 9, ensuring that no digit is repeated within each row, column, or subgrid.
- It has error-checking features to assist players in their puzzle-solving endeavors, promoting continuous learning and improvement.
- Whether played casually or competitively, Sudoku Solver is sure to provide hours of entertainment and mental stimulation for players of all backgrounds and skill levels.



1.1 Introduction

Sudoku is a popular logic-based number puzzle game that involves filling a 9x9 grid with numbers from 1 to 9, with each number appearing only once in each row, column, and 3x3 sub-grid. The goal of the game is to complete the grid by filling in all the blank spaces with the correct numbers.

A mini project for a Sudoku game typically involves developing a graphical user interface (GUI) that allows users to interact with the game and solve Sudoku puzzles. The game may also include features such as generating new puzzles, checking for errors in the user's solution, and providing hints and solutions to help the user solve the puzzle.

The Sudoku game may be implemented using a programming language such as Python, Java, or C++. The game typically involves using algorithms and data structures such as backtracking and arrays to generate and solve puzzles, store user input, and check for errors.

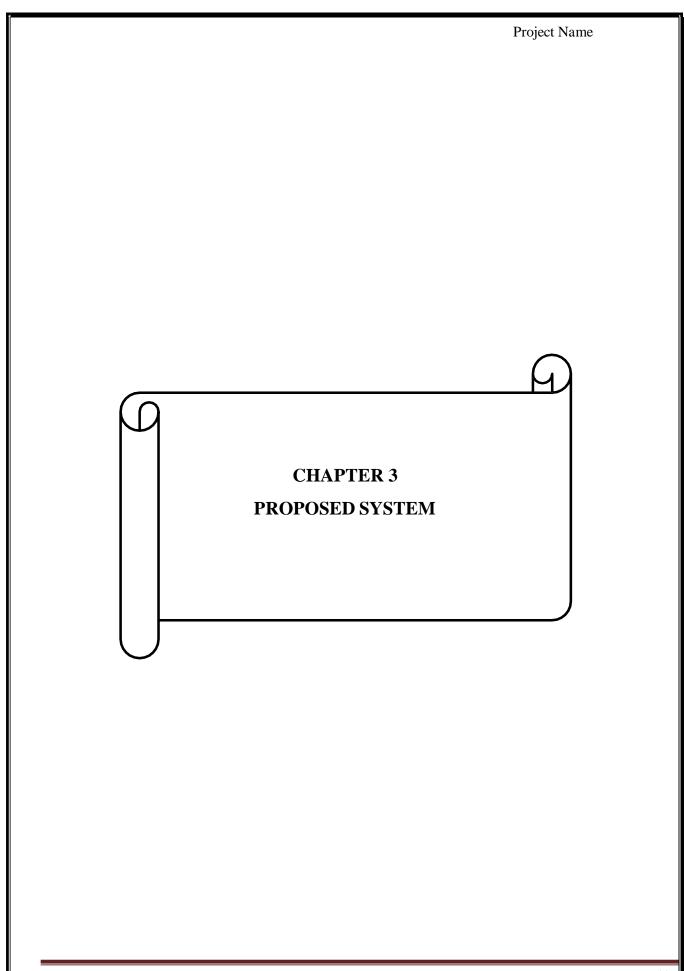
Overall, a Sudoku game mini-project is a great way for beginners to gain experience in programming and problem-solving while providing a fun and engaging game for users to enjoy.

Pro	inat.	N 1	01110

2. Literature Survey:

1)Sudoku is a popular game that has been implemented in various forms and platforms, including mobile apps, websites, and desktop applications. A literature survey of existing systems reveals several notable implementations of Sudoku games.

- 2)One popular implementation is the Sudoku game developed by Peter Norvig, a well-known computer scientist and author of the book "Artificial Intelligence: A Modern Approach." Norvig's implementation uses a combination of constraint propagation and search algorithms to generate and solve Sudoku puzzles. The game is available on his website and has been used as a benchmark for other Sudoku solvers.
- 3)A mobile app implementation of Sudoku is the "Sudoku Free" game developed by Finger Arts. The app includes various difficulty levels, automatic note-taking, and the ability to undo and redo moves. The game also includes a global leaderboard for players to compete with each other.
- 4) In addition to these implementations, numerous other Sudoku games are available on various platforms, each with unique features and design choices. Overall, existing systems show that Sudoku can be implemented using a variety of techniques and technologies, and can provide an engaging and challenging game for players of all skill levels.



3. Proposed System:

To address these issues, the proposed system for a Sudoku game will include the following features:

Error checking: The game will check for errors in the user's solution in real time and highlight any mistakes, helping the player identify and correct errors quickly.

Intuitive user interface: The game will have a clean and user-friendly interface that is easy to navigate and understand, ensuring that new users can quickly learn how to play the game.

Modules:

The modules are as follows: -

1. User Interface Module:

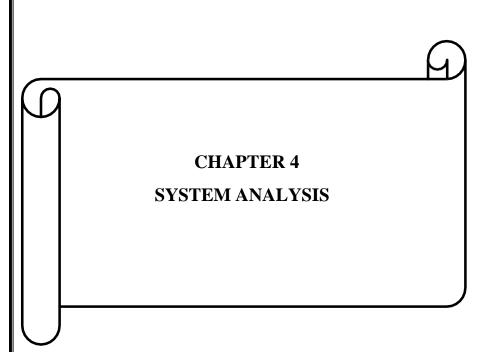
Responsible for presenting the game to the user and receiving input.

2. Puzzle Generator Module:

Ensures the generated puzzles are solvable with a unique solution.

3. Puzzle Solver Module:

Implements algorithms to solve Sudoku puzzles.



4. System Analysis

4.1 Problem Statement

The problem is to design and develop a Sudoku game program that allows users to play the game on a computer. The program should be efficient in solving Sudoku puzzles using a backtracking algorithm. It should have a user-friendly interface, with the ability to input custom puzzles or generate random ones.

4.2 System Requirements

4.2.1Software Requirements:

1)Operating System: Windows 7 or higher

2)Programming Language: C++

3)Integrated Development Environment (IDE): Visual Studio Code

4)Libraries: Qt (for C++)

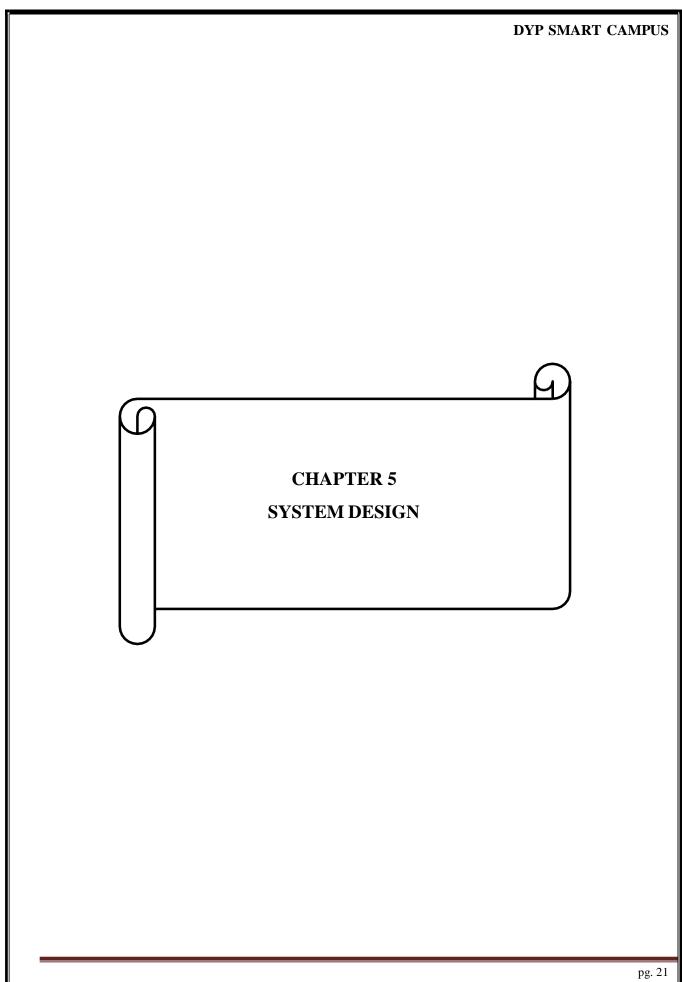
4.1.2Hardware Requirements:

1)Processor: Intel Pentium or equivalent

2)RAM: 512 MB

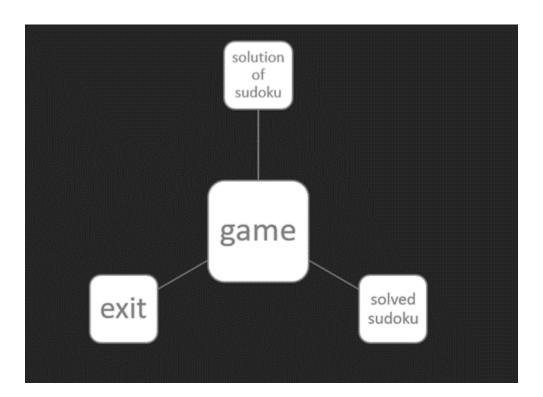
3)Hard Disk Space: 50 MB

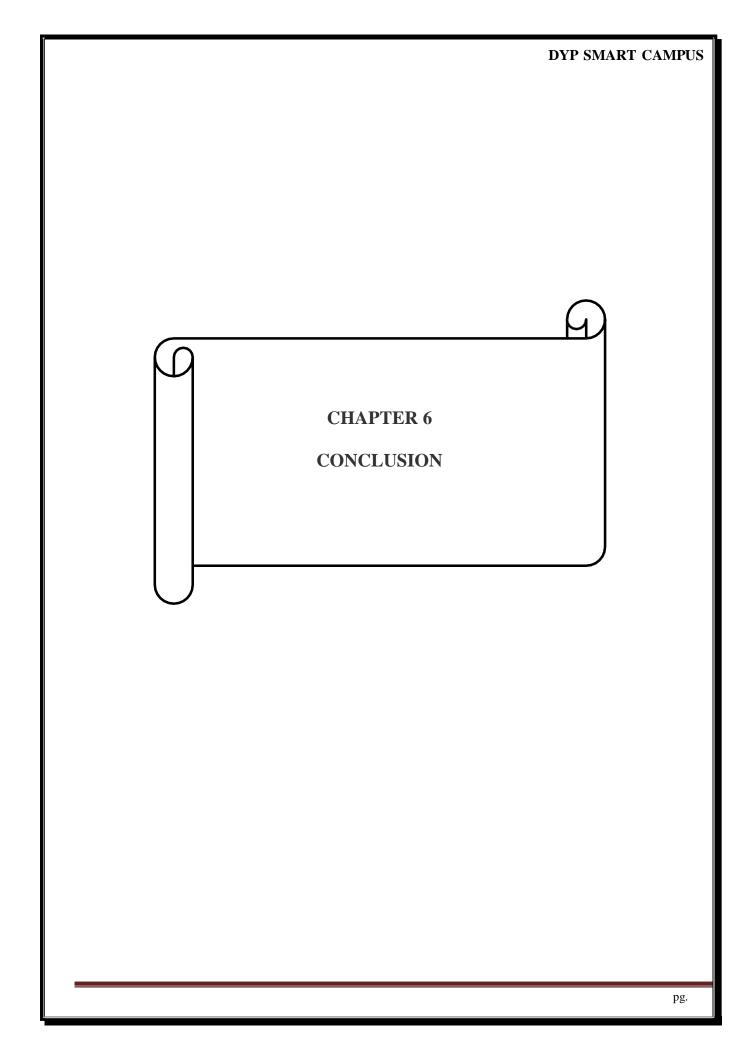
4) Graphics: Any graphics card with DirectX 9.0 or higher.



5. System Design:

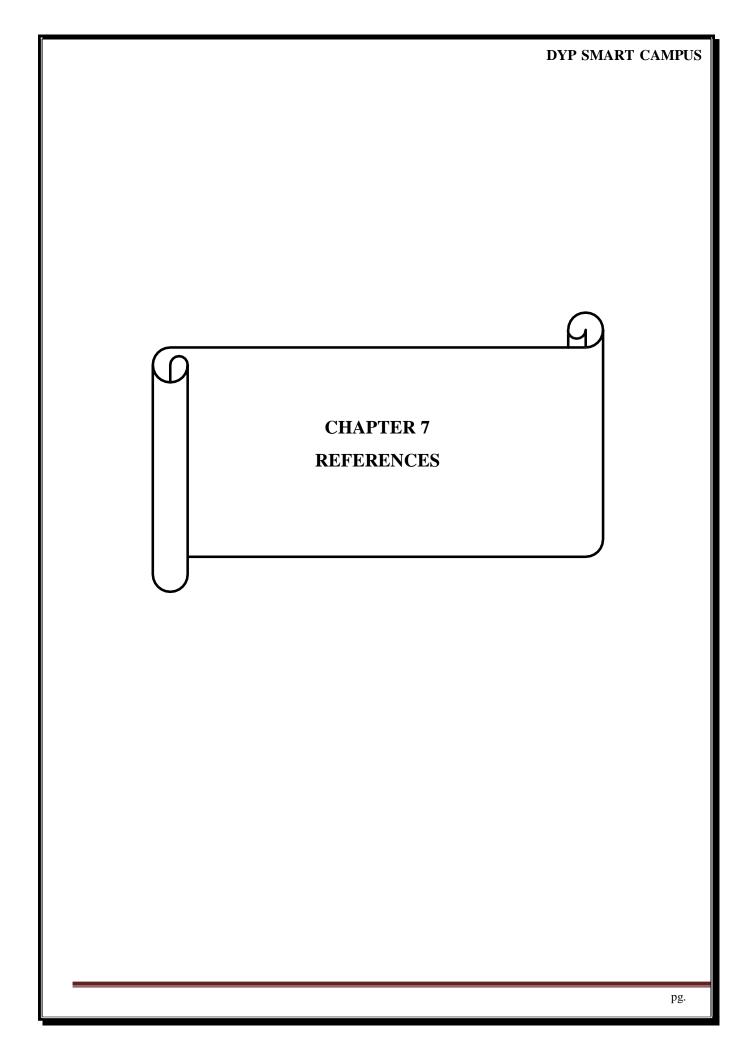
5.1 System Architecture:





6.1. Conclusion:

In conclusion, the Sudoku Solver project successfully implements an efficient algorithm to solve Sudoku puzzles. By utilizing techniques such as backtracking and constraint propagation, the solver can solve puzzles of varying difficulties. The project demonstrates the ability to accurately validate and fill in missing numbers within the puzzle grid, providing a user-friendly and reliable Sudoku-solving experience. Through this project, valuable insights into algorithmic problem-solving and logical reasoning have been gained, making it a valuable contribution to the field of computer science.



7.1. References:

GeeksForGeeks.com cppreference.com sudoku-game · GitHub Topics · GitHub

BOOK's

The C++Standard Library: A Tutorial and Reference