

JAVA PROGRAMMING

INTERNSHIP REPORT

Submitted by

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22ITR003

in partial fulfilment of the requirements

for the award of the degree

of

BACHELOR OF TECHNOLOGY

IN

KONGU ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION TECHNOLOGY



KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI ERODE – 638 060

AUGUST 2024

DEPARTMENT OF INFORMATION TECHNOLOGY

KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI ERODE – 638060

AUGUST 2024

BONAFIDE CERTIFICATE

This is to certify that the project reports entitled "**Guess the Number**", "**Rock, Paper**", "**Tic-Tac-Toe**" and "**Connect Four**" are bonafide records of the project work done by ABISHEK PRANAV S A (22ITR003) in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Information Technology at Anna University, Chennai, during the academic year 2024-2025.

SUPERVISOR

HEAD OF THE DEPARTMENT

(Signature with seal)

Date:

DEPARTMENT OF INFORMATION TECHNOLOGY

KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI ERODE – 638060

AUGUST 2024

DECLARATION

We affirm that the Internship Report titled “**JAVA PROGRAMMING**” being submitted in partial fulfilment of the requirements for the award of **Bachelor of Technology** is the original work carried out by us. It has not formed the part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

(Signature of the candidate)

Date:

ABISHEK PRANAV S A
(22ITR003)

I certify that the declaration made by the above candidates is true to the best of my knowledge.

Date:

Name and Signature of the Supervisor with seal

ABSTRACT

The projects are aimed at enhancing the understanding of Java programming and game logic. The first project, Guess the Number, involved creating an interactive game where users attempt to guess a randomly generated number within a specified range. This project focused on utilizing loops and conditionals to provide feedback on user guesses and track the number of attempts. The second project, Rock-Paper-Scissors, implemented a decision-based game where the user plays against the computer, utilizing random outcomes and simple conditional logic to determine the winner.

The third project, Tic-Tac-Toe, required the development of a 3x3 grid game in which a human player competes against a CPU. The implementation involved managing player moves, checking win conditions, and ensuring a smooth game flow. The final project, Connect Four, extended the complexity by introducing a 6x7 grid where players aim to connect four consecutive discs. This project emphasized grid handling, detecting win conditions, and managing larger game states.

Overall, this project provided hands-on experience in developing interactive applications and reinforced my knowledge of algorithms and control structures in Java.

ACKNOWLEDGEMENT

First and foremost, we acknowledge the abundant grace and presence of Almighty throughout different phases of the project and its successful completion.

We wish to express our hearty gratitude to our honourable Correspondent **Thiru. A. K. ILANGO B.Com., MBA., LLB.**, and other trust members for providing us all the necessary provisions to complete the project successfully.

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We express our gratitude to **Dr. S. ANANDAMURUGAN B.E., M.E., Ph.D.**, Head of the Department, Department of Information Technology, for his valuable guidance and support.

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We are highly indebted to **Ms. R . Aarthi B.E., M.E.**, Assistant Professor, Department of Information Technology, for his valuable supervision and advice for the fruitful completion of the project.

We extend our thanks to all the faculty and staff of our department for their kind support throughout our course of study.

Finally, we extend our love and thanks to our Parents and Friends for their moral support throughout this period of project work.

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LIST OF ABBREVIATIONS

RNG	Random Number Generator
OOP	Object-Oriented Programming
Tic-Tac-Toe	A classic two-player game where players alternately mark X or O in a 3x3 grid to achieve three in a row.
Connect four	A two-player game where players take turns dropping discs into a grid to connect four in a row.

INTERNSHIP OFFER LETTER

InternPE
Jaipur Rajasthan



OFFER LETTER

IPI#34961

Dear ABISHEK PRANAV S A,

We are delighted to welcome you for the Internship Program of **JAVA Programming** being observed by INTERNPE, as a learning opportunity for you.

Your Internship starts on **05/08/2024** and ends on **01/09/2024**. It's **04 Weeks** program. It's also an unpaid program all focus is on learning.

We look forward to a worthwhile and faithful association that will make you equipped for future projects. Wishing you the most enjoyable and truly meaningful internship program experience.


(Co-Founder)
InternPe



<https://internpe.in/>

CHAPTER 1

INTRODUCTION

Project1: Guess the Number

The objective of the Guess the Number project was to create a simple Java-based game where the user has to guess a number randomly generated by the computer within a defined range. The task was aimed at improving logical problem-solving and implementing basic algorithms in Java.

Key steps involved:

- **Random Number Generation:** The program generates a random number within a range (e.g., 1 to 100).
- **User Interaction:** The user is prompted to guess the number, and after each guess, the program provides feedback indicating if the guess is too high, too low, or correct.
- **Algorithm Logic:** The process continues until the correct guess is made, with the program tracking the number of attempts.
- **Game Flow:** The loop ensures the game runs until the user correctly guesses the number.

This project offered practical experience in handling user input, conditional statements, and loops, providing an engaging way to reinforce Java programming fundamentals.

Project2: Rock Paper Scissors Game

The goal of this project was to develop a Java-based Rock, Paper, Scissors game where the user competes against the computer. The project focuses on decision-making algorithms and improving user input handling in Java.

Key steps included:

- **Game Rules:** The user chooses between rock, paper, or scissors, and the computer makes a random selection. The program then determines the winner based on predefined rules: Rock beats Scissors, Scissors beats Paper, and Paper beats Rock.
- **Randomization:** The computer's choice is generated randomly using Java's `Random` class.
- **Decision Logic:** Using if-else statements, the program compares the choices to determine the winner or if the game results in a tie.
- **Multiple Rounds:** The game repeats for several rounds, allowing the user to play again or exit.

This project effectively demonstrated how simple decision-making processes and input handling can be applied to create an interactive game in Java.

Project 3: Tic-Tac-Toe The objective of the Tic-Tac-Toe project was to develop a Java-based two-player game where a human plays against the CPU, aiming to complete a row, column, or diagonal with their symbol (X or O). The project focused on implementing basic game logic, user interaction, and efficient decision-making algorithms for the CPU.

Key steps involved:

- **Game Board Design:** The game board was represented using a 3x3 grid, with each position marked by a number (1 to 9) for easy move selection.
- **User vs. CPU Interaction:** The user plays against the computer, with the user and CPU alternating turns. The CPU uses basic strategies to make its moves.
- **Input and Validation:** The program ensures that moves are valid, preventing the selection of already occupied cells.
- **Winning Conditions:** The game checks for victory or a tie after each move, ending the game once a player wins or the board is full.
- **Game Flow:** After each move, the updated board is displayed, giving players visual feedback.

This project helped enhance skills in logical problem-solving, game flow management, and algorithm implementation in Java.

Project 4: Connect Four The Connect Four project was aimed at creating a more complex board game where two players (or a player vs. CPU) try to connect four discs in a row, column, or diagonal within a 6x7 grid. The task emphasized advanced grid management and game state tracking.

Key steps involved:

- **Grid Representation:** The 6x7 board was represented as a two-dimensional array, with each position being empty or occupied by one player's disc.
- **Player Interaction:** Players take turns dropping a disc into one of the columns, with the disc falling to the lowest available row.
- **Winning Logic:** The game checks after each move whether there are four consecutive discs vertically, horizontally, or diagonally.
- **Game Validation:** The program prevents invalid moves, such as selecting a full column, and handles game end conditions like wins or draws.
- **User Interface:** The game visually updates the grid after each move, ensuring players can follow the progress easily.

This project provided a deeper understanding of Java arrays, multidimensional data handling, and enhanced problem-solving capabilities in game development.

CHAPTER 2

ABOUT THE COMPANY

INTERNPE is a leading technology firm focused on delivering cutting-edge solutions across diverse sectors, including software development, artificial intelligence (AI), machine learning (ML), and data analytics. The company's mission is to harness innovative technologies to empower businesses, enabling them to streamline operations, make data-driven decisions, and remain competitive in today's rapidly evolving digital landscape. INTERNPE offers custom software and AI-based solutions designed to meet the specific needs of industries such as healthcare, finance, retail, and manufacturing. With a strong emphasis on cloud computing, the Internet of Things (IoT), and advanced analytics, INTERNPE has built a reputation as a trusted partner for organizations seeking to integrate AI and automation into their processes. A key driver of INTERNPE's success is its commitment to ongoing research and development (R&D), ensuring the company stays at the forefront of technological advancements. INTERNPE is also well-known for its robust internship programs, which provide aspiring professionals with hands-on experience in areas like data preprocessing, model training, and deployment. During the internships, students work on real-world projects under the guidance of seasoned mentors, gaining exposure to the complete software development lifecycle while refining their technical and analytical skills. In addition to technical training, INTERNPE's internship programs emphasize teamwork, communication, and project management, preparing students for success in the competitive tech industry. Through its innovative solutions and commitment to fostering talent, INTERNPE continues to drive digital transformation across industries while nurturing the next generation of tech professionals.

CHAPTER 3

PROJECT 1 - GUESS THE NUMBER

3.1 Problem Identification

The goal of this project was to create a simple Java-based game where the user has to guess a number generated randomly by the computer within a given range. The task aimed to help users improve their problem-solving skills and understand how basic algorithms work in a real-world scenario.

3.2 Game Design

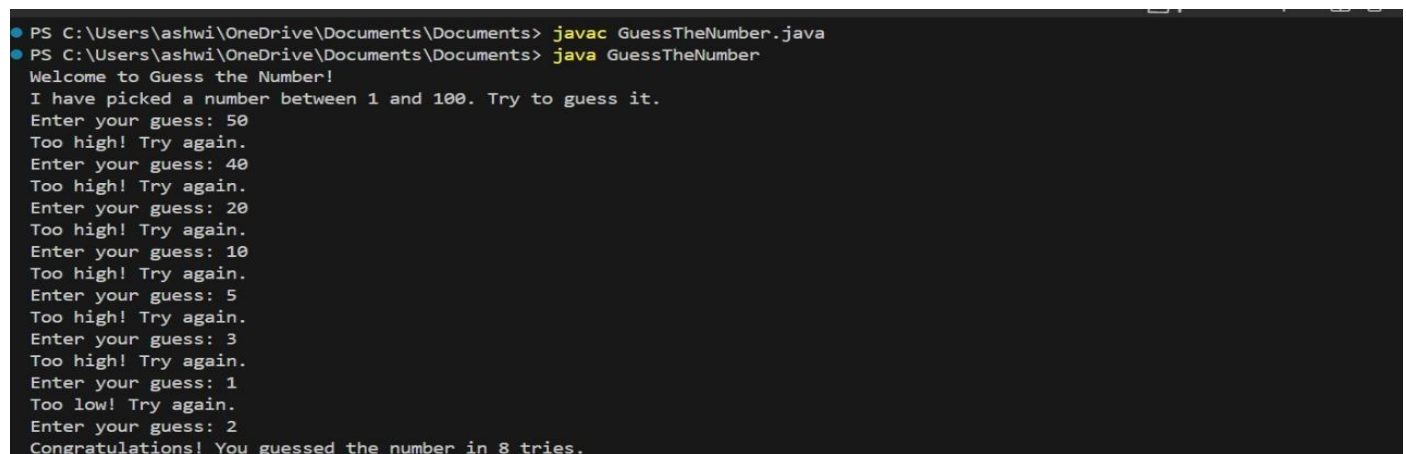
The program starts by generating a random number between a specified range (e.g., 1 to 100). The user is prompted to guess the number, and after each guess, the program provides feedback indicating whether the guess is too high, too low, or correct. The process continues until the user guesses the correct number.

3.3 Algorithm and Flow

- A random number is generated using Java's `Random` class.
- The user is asked to input their guess.
- The program checks if the guess is equal to the randomly generated number.
- If the guess is too low, the program prompts the user to guess higher.
- If the guess is too high, the program prompts the user to guess lower.
- The game continues until the correct guess is made, and the program outputs the number of attempts taken by the user.

3.4 Results and Evaluation

The game was successfully implemented, and users were able to interact with the program. Feedback from users indicated that the game was intuitive and easy to play.

A screenshot of a Windows command prompt window with a dark background. The text is white. It shows the compilation and execution of a Java program named 'GuessTheNumber.java'. The program prompts the user to guess a number between 1 and 100. The user enters several guesses (50, 40, 20, 10, 5, 3, 1, 2), and the program provides feedback: 'Too high! Try again.' for guesses 50 through 5, 'Too low! Try again.' for guess 1, and 'Congratulations! You guessed the number in 8 tries.' for guess 2.

```
PS C:\Users\ashwi\OneDrive\Documents\Documents> javac GuessTheNumber.java
PS C:\Users\ashwi\OneDrive\Documents\Documents> java GuessTheNumber
Welcome to Guess the Number!
I have picked a number between 1 and 100. Try to guess it.
Enter your guess: 50
Too high! Try again.
Enter your guess: 40
Too high! Try again.
Enter your guess: 20
Too high! Try again.
Enter your guess: 10
Too high! Try again.
Enter your guess: 5
Too high! Try again.
Enter your guess: 3
Too high! Try again.
Enter your guess: 1
Too low! Try again.
Enter your guess: 2
Congratulations! You guessed the number in 8 tries.
```

Fig 1.1

CHAPTER 4

PROJECT 2 – ROCK PAPER SCISSORS GAME

4.1 Problem Identification

The goal of this project was to create a Java-based Rock, Paper, Scissors game where the user plays against the computer. The game demonstrates basic decision-making algorithms and user input handling in Java.

4.2 Game Design

The user selects rock, paper, or scissors, while the computer randomly selects one of the three options. The rules are:

- Rock beats Scissors.
- Scissors beats Paper.
- Paper beats Rock. If both choose the same, it results in a tie.

4.3 Algorithm and Flow

The computer's choice is generated using the Random class.

The user inputs their choice through the Scanner class.

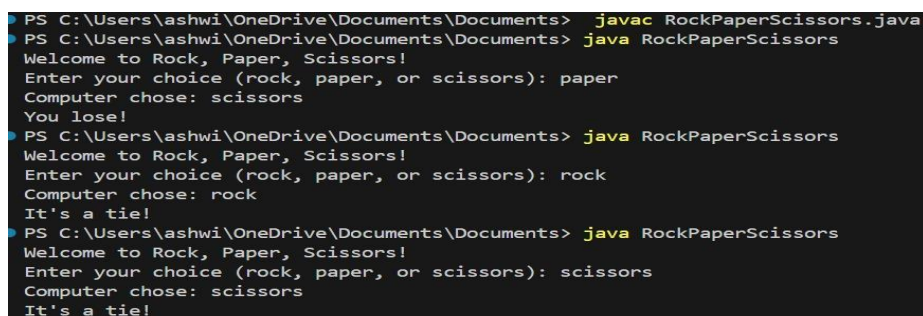
The program compares the choices using if-else statements:

- User wins, computer wins, or it's a draw.

The game repeats for multiple rounds or until the user chooses to exit.

4.4 Results and Evaluation

The game was successfully developed, with clear rules and smooth functionality across multiple rounds. It served as a simple yet effective demonstration of basic Java programming concepts.



```
PS C:\Users\ashwi\OneDrive\Documents\Documents> javac RockPaperScissors.java
PS C:\Users\ashwi\OneDrive\Documents\Documents> java RockPaperScissors
Welcome to Rock, Paper, Scissors!
Enter your choice (rock, paper, or scissors): paper
Computer chose: scissors
You lose!
PS C:\Users\ashwi\OneDrive\Documents\Documents> java RockPaperScissors
Welcome to Rock, Paper, Scissors!
Enter your choice (rock, paper, or scissors): rock
Computer chose: rock
It's a tie!
PS C:\Users\ashwi\OneDrive\Documents\Documents> java RockPaperScissors
Welcome to Rock, Paper, Scissors!
Enter your choice (rock, paper, or scissors): scissors
Computer chose: scissors
It's a tie!
```

Fig 2.1

CHAPTER 5

PROJECT 3 - TIC-TAC-TOE

5.1 Problem Identification

The aim of this project was to create a Java-based Tic-Tac-Toe game where a human player competes against the computer. The goal was to implement basic game logic, develop user interaction mechanics, and enhance problem-solving skills by simulating real-world gameplay using conditional checks and loops.

5.2 Game Design

The game features a 3x3 grid with cells numbered from 1 to 9. The human player and CPU take turns to place their respective symbols (X and O) on the board. The game continues until one player aligns three symbols in a row, column, or diagonal, or the board is filled resulting in a draw. The CPU follows a simple strategy for making moves, providing a basic challenge to the human player.

5.3 Algorithm and Flow

- A 3x3 grid is displayed to the player with numbered cells , where human can enter number .
- The program checks if the cell is free, and if valid, places the player's symbol.
- The CPU takes its turn, placing its symbol in an available cell using a basic strategy.
- After each move, the program checks for winning conditions or a draw.
- The game ends when a player wins by forming a row, column, or diagonal, or if the grid is completely filled.

5.4 Results and Evaluation

The Tic-Tac-Toe game was successfully implemented, offering an engaging experience where users could play against the CPU. The project effectively demonstrated game development fundamentals and reinforced programming logic.

```
Board:
  | 0 | X
+ + + + +
X | 0 | X
+ + + + +
X | 0 | 0
Player 0 wins!
```

Fig 3.1

CHAPTER 6

PROJECT 4 - CONNECT FOUR

6.1 Problem Identification

The Connect Four project focused on developing a two-player game (or player vs CPU) where the objective is to connect four consecutive discs in a row, column, or diagonal in a 6x7 grid. The challenge lay in designing an efficient grid management system and implementing game logic to handle larger data structures.

6.2 Game Design

The game uses a 6x7 grid where players take turns dropping discs into columns. Discs fall to the lowest available row in the selected column. The game continues until a player successfully connects four discs in any direction or the grid is filled, resulting in a draw. The CPU acts as the second player and makes its move based on available space and a simple strategy.

6.3 Algorithm and Flow

- A 6x7 two-dimensional array represents the game grid.
- Players alternately select a column in which to drop their disc.
- The program places the disc in the lowest available row of the selected column.
- After each move, the program checks for a winning condition (four consecutive discs) in rows, columns, or diagonals.
- The game ends when a player connects four discs or when the grid is completely filled.

6.4 Results and Evaluation

Connect Four was successfully developed, offering both player-vs-player and player-vs-CPU modes. The game logic handled complex grid management and efficiently checked for win conditions. This project demonstrated advanced array handling and logical game flow management.

```
- - - - -  
- - - - -  
- - - 0 X -  
- - - X 0 X  
0 - - X X X 0  
0 0 X 0 X X 0  
0 1 2 3 4 5 6  
Player wins!
```

Fig 4.1

CHAPTER 7

CONCLUSION

My internship at INTERNPE has been a transformative learning experience, providing me with valuable hands-on exposure to software development, problem-solving, and algorithm design in Java. Through the completion of four key projects— Guess the Number, Rock, Paper, Scissors, Tic-Tac-Toe, and Connect Four—I was able to deepen my understanding of core programming concepts such as loops, conditional logic, random number generation, and user interaction. These projects allowed me to improve my skills in designing interactive games, implementing efficient logic, and writing clean, maintainable code.

Additionally, the iterative process of testing and optimizing the code enhanced my ability to refine solutions and ensure smooth gameplay experiences. The guidance from mentors further strengthened my programming foundation while also helping me develop important soft skills like communication and time management.

Overall, this internship has greatly enriched my technical capabilities and confidence in Java programming. The experience has equipped me with the knowledge and practical skills necessary to tackle more complex challenges in future projects and roles, and I look forward to applying these learnings as I continue my journey as a software developer.

INTERNSHIP COMPLETION CERTIFICATE



InternPe

INTERNSHIP COMPLETION CERTIFICATE

IPI#34961

To whomever it may concern

Dear ABISHEK PRANAV S A,

This is to certify that you worked as an Intern in our company from
05-Aug-2024 to 01-Sept-2024.

Please find the internship details below:

Company Name: InternPe

Domain : Java Programming

Designation: Intern

During their working period, we found him/her to be a sincere and dedicated intern with a professional attitude and very good knowledge of the job.

We thank him/her for their efforts and contribution and wish him/her the best in future endeavors.

Yours Sincerely

**(Co-Founder)
InternPe**



www.internpe.in