Synopsis

(Mini Project Work)

IIMT COLLEGE OF ENGINEERING, Gr. NOIDA

Bachelor of Technology

Department of Information Technology

November, 2020

Calendar (Note Entry) and Tic Tac Toe Game

Submitted By:
Harshit Tyagi
B-Tech. (IT)
3rd Sem. 2nd Year
1902160130021

Submitted To:
Mr. Vishwas Chand
(Assistant Professor)
IT Department
IIMT Engg. College

INDEX

Acknowledgement

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

I am highly indebted to **Mr. Vishwas Chand** (Assistant Professor) for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.

I would like to express my gratitude towards my parents & member of **IIMT College of Engineering Gr. Noida** for their kind co-operation and encouragement which help me in completion of this project.
I would like to express my special gratitude and thanks to industry persons for giving me such attention and time.

My thanks and appreciations also go to my colleague in developing the project and people who have willingly helped me out with their abilities.

Project Abstract

- The **Calendar** and **Tic Tac Toe** game applications presented here are very simple console application developed in C programming language.

- Both are built without using graphics properties; instead, both utilize many windows properties to give the application a colorful look and feel.

- Both applications are combined in a single program and compiled in Code::Blocks using GCC compiler.

Introduction

Calendar:

A **calendar** is a system of organizing units of time for the purpose of reckoning time over extended periods. By convention, the day is the smallest calendrical unit of time; the measurement of fractions of a day is classified as timekeeping. The generality of this definition is due to the diversity of methods that have been used in creating calendars. Although some calendars replicate astronomical cycles according to fixed rules, others are based on abstract, perpetually repeating cycles of no astronomical significance. Some calendars are regulated by astronomical observations, some carefully and redundantly enumerate every unit, and some contain ambiguities and discontinuities. Some calendars are codified in written laws; others are transmitted by oral tradition.

In most societies a calendar reform is an extraordinary event. Adoption of a calendar depends on the forcefulness with which it is introduced and on the willingness of society to accept it. For example, the acceptance of the Gregorian calendar as a worldwide standard spanned more than three centuries.

Tic Tac Toe :

Tic-tac-toe, also called **Noughts and Crosses** (in the British Commonwealth countries), Xs and Os (in Ireland) and X and 0 (in India) is a pencil-and-paper game for two players, X and O, who take turns marking the spaces in a 3×3grid. The player who succeeds in placing three respective marks in a horizontal, vertical, or diagonal row wins the game. Hence, tic-tac-toe is most often played by young children. The friendliness of tic-tac-toe games makes them ideal as a pedagogical tool for teaching the concepts of good sportsmanship and the branch of artificial intelligence that deals with the searching of game trees. It is straight forward to write a computer program to play tic-tac-toe perfectly.

In 1952, OXO (or Noughts and Crosses), developed by British computer scientist Sandy Douglas for the EDSAC computer at the University of Cambridge, became one of the first known video games. The computer player could play perfect games of tic-tac-toe against a human opponent.

Motivation

Calendar:

Diary entries are normally associated with the teenage years, scrawling down passages about you and your friends or your latest crush. However, diaries are not just for the besotted teenager – carry on reading if you're interested in the traits of successful people who keep a regular diary.

- **They Practice Self-Discipline**
  Regular diary writing takes self-discipline and perseverance. However, diaries can teach the art of discipline, writing regularly in order to look back on entries, rather than seeing results instantaneously.
- **They Use Diaries to Self-heal**
  People who write regular diary entries become able to boost their own feelings, getting all their thoughts down onto a page in order to see perspective.

- **They are Confident**
  In being honest about how they're feeling, people who write diaries are naturally very confident, particularly if they're using an online diary.
- **They Have a Strong Focus on Ambition**
  Being able to look back on past thoughts and feelings can allow you direction and ambition in future ventures.
- **They are Motivated**
  Writing down your thoughts allows reflection, and can show how well you're using your time, a great motivator for future aspirations.
- **And Finally, They Have a Productive Way to End the Day**
  There's nothing better than getting home from a long day and talking it through with someone – however, by keeping a diary you can manage your thoughts at any time, and can conclude your day by getting everything down on paper to clear your over-worked mind.

Tic Tac Toe

Tic-tac-toe has been a part of almost everyone's childhood, but for the wrong reasons. Most adults and children think it's a simple game to pass the time; that it's a game similar to what playing on the playground means today—it's done when the power's out and there's nothing else to do.

Now that there are a lot of mobile game apps available, the importance of playground time and the seemingly simple game of tic-tac-toe has been overlooked. Children nowadays learn to be technologically savvy at an early age, using tablets or smart phones to learn their ABCs or hear audios of bedtime rhymes. This presents a problem especially if it sacrifices children's time for fun outdoors like playing at a commercial playground with other kids or playing games and puzzles with either their parents or teachers.

The game of tic-tac-toe is a game of predictability. The moves that are believed to be important are highly predictable. This also makes it a game of opposites in a way,

because this goes against the definition of an “important move”. But this predictability is what helps foster strategic thinking in children. They can learn through observation what their opponents’ next move is and think ways on how to block them, a simple but effective version of chess. In order to figure out what else they can do in the game to win, the children are encouraged to think more logically. They, therefore, naturally develop their logico-mathematical thinking, which can help them in subjects such as math and engineering in the future.

By encouraging logical thinking, tic-tac-toe helps children develop their spatial skills. This skill is important for their problem solving abilities—from everyday simple chores to complex mathematical equations Besides from a simple game of tic-tac-toe, children can also develop their spatial abilities by playing around commercial playground equipment.

Related Works

Subject specific:

- Apply underlying concepts and principles from academic learning in a workplace context.
- Select technology appropriate for the solution of a specific problem or business requirement.
- Plan and manage a small IT project.

Intellectual:

- Determine relevant skills to apply to a particular task
- Identify and plan additional learning required for successful completion of a specific project
- Reflect critically on their learning and evaluate its relevance and limitations.

Practical:

- Utilize a range of IT tools and techniques to meet a business need.
- Present information effectively and appropriately to a group of peers and tutors/workplace supervisors.
- Produce a portfolio of work to a professional standard.

Personal and Social:

- Engage professionally with an organization.
- Manage and monitor own learning activities.

Technology Description

Introduction to C- Language:

C is a general-purpose high level language that was originally developed by Dennis Ritchie for the UNIX operating system. It was first implemented on the Digital Equipment Corporation PDP-11 computer in 1972.

C-language has now become a widely used professional language for various reasons:

- Easy to learn.
- Structured language.
- It produces efficient programs.
- It can handle low-level activities.
- It can be compiled on a variety of computers.

Facts about C-language:

- C-language is a successor of B language which was introduced around 1970.
- The language was formalized in 1988 by the American National Standard Institute (ANSI).

Why to use C-language?

C was initially used for system development work, in particular the programs that make-up the operating system. C was adopted as a system development language because it produces code that runs nearly as fast as code written in assembly language.

C Program File:

All the C programs are written into text files with extension ".c" for example ‘hello.c’. You can use "vi" editor to write your C program into a file.

C-Compilers:

When you write any program in C language then to run that program you need to compile that program using a C Compiler which converts your program into a language understandable by a computer. This is called machine language (i.e. binary format). So before proceeding, make sure you have C Compiler available at your computer. It comes along with all flavors of UNIX and Linux.

The components of the above structure are:

Header Files Inclusion: The first and foremost component is the inclusion of the Header files in a C program.

Some of C Header files:

stddef.h – Defines several useful types and macros.

stdint.h – Defines exact width integer types.

stdio.h – Defines core input and output functions

stdlib.h – Defines numeric conversion functions, pseudo-random network generator, memory allocation

string.h – Defines string handling functions

math.h – Defines common mathematical functions

Syntax to include a header file in C: #include

Main Method Declaration: The next part of a C program is to declare the main( ) function

Syntax to Declare main method:

```
int main( )
{}
```

Variable Declaration: It refers to the variables that are to be used in the function.

Please note that in the C program, no variable can be used without being declared. Also in a C program, the variables are to be declared before any operation in the function.

Body: Body of a function in C program, refers to the operations that are performed in the functions.

Return Statement: The last part in any C program is the return statement. The return statement refers to the returning of the values from a function.

Data Types: Variables are nothing but reserved memory locations to store values. This means that when you create a variable you reserve some space in memory. You may like to store information of various data type like character, wide character, integer, floating point, double floating point, Boolean etc.

Type	Typical Bit Width	Typical Range
Char	1byte	-127 to 127 or 0 to 255
Int	4bytes	-2147483648 to 2147483647
Bool	1byte	false or true

Operators:

Once we know of the existence of variables and constants, we can begin to operate with them. For that purpose, C integrates operators. This makes C code shorter and more international, since it relies less on English words, but requires a little of learning effort in the beginning.

1. **Assignment (=):** The assignment operator assigns a value to a variable. a = 5;
2. **Arithmetic operators** (+, -, *, /, %)

The five arithmetical operations supported by the C-language are:

+	Addition,
-	Subtraction
*	Multiplication
/	Division
%	Modulo

3. **Relational and equality operators**

==	Equal to
!=	Not equal to

4. **Logical operators(!, &&)**

! ORERATOR

```
!(5 == 5)   // evaluates to false because the expression at its
               right (5 == 5) is true.
!(6 <= 4)   // evaluates to true because (6 <= 4) would be false.
!true       // evaluates to false
!false      // evaluates to true
```

5. && OPERATOR

a	b	a&&b
True	False	False
False	False	False
False	True	False
True	True	True

C Pointers

The pointer in C language is a variable which stores the address of another variable

Declaring a pointer:

The pointer in c language can be declared using * (asterisk symbol). It is also known as indirection pointer used to dereference a pointer.

Usage of pointer:

There are many applications of pointers in c language.

1) **Dynamic memory allocation:** In c language, we can dynamically allocate memory using malloc() and calloc() functions where the pointer is used.
2) **Arrays, Functions, and Structures:** Pointers in c language are widely used in arrays, functions, and structures. It reduces the code and improves the performance.

File Handling in C

File handling in C enables us to create, update, read, and delete the files stored on the local file system through our C program.

The following operations can be performed on a file.

- Creation of the new file
- Opening an existing file
- Reading from the file
- Writing to the file
- Deleting the file

Functions for file handling:

There are many functions in the C library to open, read, write, search and close the file.

No.	Function	Description
1	fopen()	opens new or existing file
2	fprintf()	write data into the file
3	fscanf()	reads data from the file
4	fputc()	writes a character into the file
5	fgetc()	reads a character from file
6	fclose()	closes the file
7	fseek()	sets the file pointer to given position
8	fputw()	writes an integer to file
9	fgetw()	reads an integer from file
10	ftell()	returns current position
11	rewind()	sets the file pointer to the beginning of the file

C Structure:

In C, there are cases where we need to store multiple attributes of an entity. It is not necessary that an entity has all the information of one type only. It can have different attributes of different data types.

We use a special data structure to store the collection of different data types.

What is Structure?

Structure in c is a user-defined data type that enables us to store the collection of different data types. Each element of a structure is called a member. Structures can simulate the use of classes and templates as it can store various information.

typedef in C

The typedef is a keyword used in C programming to provide some meaningful names to the already existing variable in the C program. It behaves similarly as we define the alias for the commands. In short, we can say that this keyword is used to redefine the name of an already existing variable.

Methodology

Tic Tac Toe:

Theory of Game:

1. A player can choose between two symbols with his opponent, usual games use “X”and “O”. If first player choose “X” then the second player have to play with “O” and vice versa.

2. A player marks any of the 3x3 squares with his symbol (may be “X” or “O”) and his aim is to create a straight line horizontally or vertically or diagonally with two intensions:
   a) Create a straight line before his opponent to win the game.

   b) Restrict his opponent from creating a straight line first.

3. In case logically no one can create a straight line with his own symbol, the game results a tie.

4. Hence there are only three possible results – a player wins, his opponent wins or it’s a tie.

Implementation in Project:

- Users are allowed to choose the number from 1 to 9 in the given layout to which he/she wants his symbol to be replaced.

- System will read that number and compare it to the numbers which are already stored in the memory and replace the number to the symbol (either ‘X’ or ‘O) and then display the updated layout.

- No symbol can be replaced twice because when the value was first update it also update the value of count variable and conditions are applied that symbols are replaced only at former value of count.

- On entering value of the position to be replaced by the symbol a function matches the elements of three consecutive positions, if following positions matches then it declares the matched symbol as winner otherwise it continues to get the input for rest positions up to 9 positions.

- Input can be entered maximum nine times.

- If no three consecutive symbols matched then the game will be declared as Draw.

Calendar:

Theory:

- The solar year consists of 365 days, 5 hours, 48 minutes. In Julian calendar, the year arranged in 47 BC by Julius Caesar was taken as being of 365¼ days and in order to get rid of odd quarter of a day, an extra day was added once in every fourth year called Leap year. This was also called Bissextile.

- This type of old calendar is now used in Russia only. But, as the solar year is 11 minutes 12 seconds less than a quarter of a day, the Julian calendar became inaccurate by several days and in 1582 AD, this difference amounted to 10 days.

- Pope Gregory XIII determined to rectify this and devised calendar known as Gregorian Calendar. He dropped or cancelled 10 days − October 5th being called 15th October and made centurial years leap years only once in 4 centuries. So 1700, 1800, and 1900 were ordinary years and 2000 was a leap year.

- This modification brought the Gregorian system into such close exactitude with the solar year that there is only a difference of 26 seconds which amounts to a day in 3323 years.

- This is the New style. It was ordered by an Act of Parliament to be adopted in England 1752. After 170 years, this information is now used throughout the civilized world with the single exception already named.

Implementation in Project:

- The most important thing to be kept in mind while printing yearly calendar is to get the number of first day of the year which we can get from the following algorithm:

  d = (((y - 1) * 365) + ((y - 1) / 4) - ((y - 1) / 100) + ((y) / 400) + 1) % 7;

- Second important thing is to check whether the entered year is a leap year or not if it is leap year then February contain 29 days otherwise 28days.

  Leap year can be checked by the following algorithm

```
if ((y%4==0&&y%100!=0)||(y%400==0))
    feb_days=29;
```

- Thirdly we divide the days into weeks if no of days exceeds seven then new week started.

```
if(++weekday>7) {
    printf("\n");
    weekday=0;
    }startingDay = weekday;
```

- Any month of any year can be printed by applying the similar logics of viewing yearly calendar but not exactly same.

- Notes can be added by using the concept of file handling and later in month view can be viewed.

Project Files

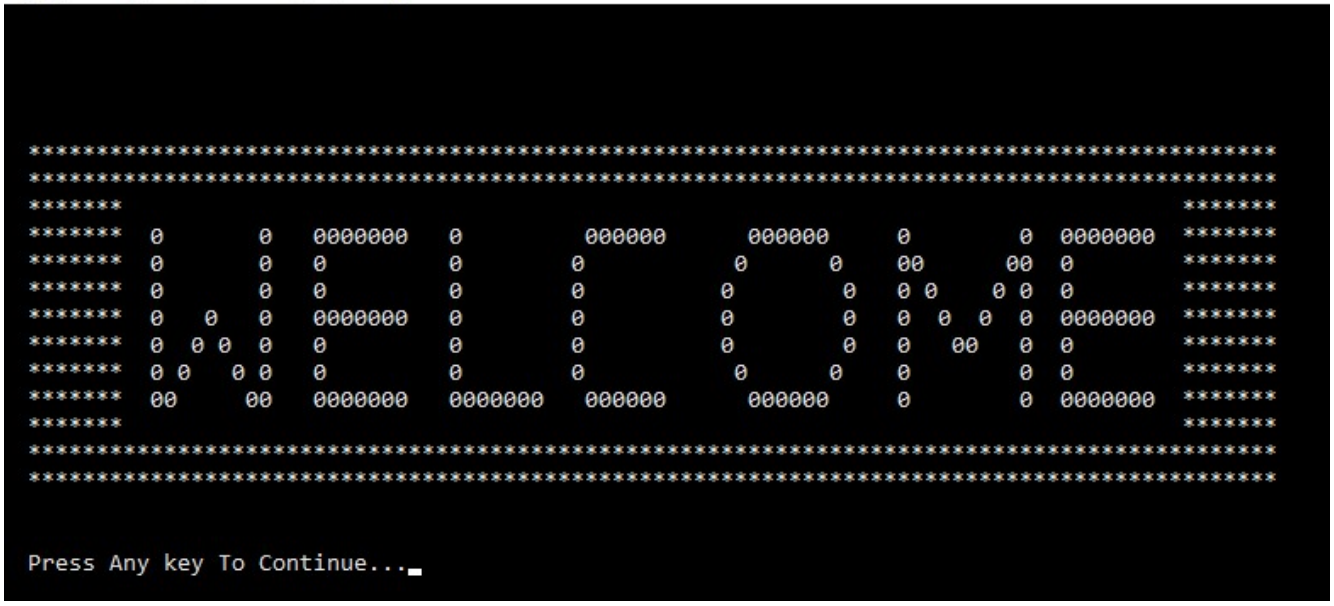
https://drive.google.com/drive/folders/1E2PhiS38as8-JygrtRn_HL1SMcql_522?usp=sharing

Source Code

https://drive.google.com/file/d/1xCQaR3hVEIP2lWAXTkht_tVVFOyziI0l/view?usp=sharing

Screenshots

: tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe"



nt tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe"

:yagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
**********************************************************************************************
*                                                                                            *
*========================== I I M T COLLEGE OF ENGINEERING ==================================*
*                                                                                            *
*======================== MINI PROJECT BASED ON C PROGRAMMING ===============================*
*                                                                                            *
*==================================== WELCOME ===============================================*
*                                                                                            *
**********************************************************************************************

 You Have Two choices
 --------------------
 Press 1 :----------->    CALENDER
 ---------------------------------
 Press 2 :----------->    To PLAY Tic Tac Toe
 -------------------------------------------
 Choice  :----------->
```

:yagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
**********************************************************************************************
*                                                                                            *
*========================== I I M T COLLEGE OF ENGINEERING ==================================*
*                                                                                            *
*======================== MINI PROJECT BASED ON C PROGRAMMING ===============================*
*                                                                                            *
*==================================== WELCOME ===============================================*
*                                                                                            *
**********************************************************************************************

 WELCOME To CALANDER OPTIONS:
 ----------------------------
 Press 1 : To View Year calendar.
 --------------------------------
 Press 2 : To view a Month.
 --------------------------
 Press 3 : To Find Day.
 --------------------------
 Press 4 : To Add Note.
 ----------------------
 Choice  :
```

C:\Users\Prasant tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
*********************************************************************************************
*                                                                                           *
*=========================== I I M T COLLEGE OF ENGINEERING ================================*
*                                                                                           *
*======================== MINI PROJECT BASED ON C PROGRAMMING ==============================*
*                                                                                           *
*==================================== WELCOME ==============================================*
*                                                                                           *
*********************************************************************************************


                        Enter the desired year to see the Calender: 2020


------------------------January------------------------

 Sun     Mon     Tue     Wed     Thurs   Fri     Sat
                          1       2       3       4
  5       6       7       8       9       10      11
  12      13      14      15      16      17      18
  19      20      21      22      23      24      25
  26      27      28      29      30      31

------------------------February-----------------------

 Sun     Mon     Tue     Wed     Thurs   Fri     Sat
                                                 1
  2       3       4       5       6       7       8
  9       10      11      12      13      14      15
  16      17      18      19      20      21      22
  23      24      25      26      27      28      29


------------------------March------------------------

 Sun     Mon     Tue     Wed     Thurs   Fri     Sat
  1       2       3       4       5       6       7
  8       9       10      11      12      13      14
  15      16      17      18      19      20      21
  22      23      24      25      26      27      28
```

sant tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
*********************************************************************************************
*                                                                                           *
*=========================== I I M T COLLEGE OF ENGINEERING ================================*
*                                                                                           *
*======================== MINI PROJECT BASED ON C PROGRAMMING ==============================*
*                                                                                           *
*==================================== WELCOME ==============================================*
*                                                                                           *
*********************************************************************************************

 Enter the following:
 Day (DD):30

 Month No.(MM) :01

 Year (YYYY)   :2021

 The day is : Saturday
```

"C:\Users\Prasant tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe"

```
*****************************************************************************************
*                                                                                       *
*========================== I I M T COLLEGE OF ENGINEERING ==============================*
*                                                                                       *
*======================== MINI PROJECT BASED ON C PROGRAMMING ===========================*
*                                                                                       *
*================================== WELCOME ============================================*
*                                                                                       *
*****************************************************************************************

 Month No.(MM) :01

 Year (YYYY)   :2021

--------------------January 2021--------------------

 Sun     Mon     Tue     Wed     Thurs   Fri     Sat
                                          1       2
 3       4       5       6       7       8       9
10       11      12      13      14      15      16
17       18      19      20      21      22      23
24       25      26      27      28      29      30
31


 Press 'N' : To see Notes.
 -------------------------
 Press 'Q' : To Exit.
 --------------------
 Choice    : N

 Here are list of notes for 1 2021

 ------------------------------------
 1 : Happy New Year...


 ------------------------------------
```

tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
*****************************************************************************************
*                                                                                       *
*========================== I I M T COLLEGE OF ENGINEERING ==============================*
*                                                                                       *
*======================== MINI PROJECT BASED ON C PROGRAMMING ===========================*
*                                                                                       *
*================================== WELCOME ============================================*
*                                                                                       *
*****************************************************************************************

 Enter the following:
 Day (DD)        :01

 Month No.(MM) :01

 Year (YYYY)   :2022

 Enter the note:  Happy New Year 2022...

 Note added Successfully...

 Press 1 :  To Continue
 ----------------------
 Press 2 :  To EXIT
```

tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
**********************************************************************************************
*                                                                                            *
*============================ I I M T COLLEGE OF ENGINEERING ================================*
*                                                                                            *
*========================== MINI PROJECT BASED ON C PROGRAMMING =============================*
*                                                                                            *
*=================================== WELCOME ================================================*
*                                                                                            *
**********************************************************************************************
*                                                                                            *
*================== T    i   c ------- T   a   c -------- T   o   e ======================*
*                                                                                            *
**********************************************************************************************

 Press 1   :  For INSTRUCTIONS
--------------------------------
 Press 2   :  For Quick PLAY
--------------------------------
 Choice    :
```

tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
**********************************************************************************************
*                                                                                            *
*============================ I I M T COLLEGE OF ENGINEERING ================================*
*                                                                                            *
*========================== MINI PROJECT BASED ON C PROGRAMMING =============================*
*                                                                                            *
*=================================== WELCOME ================================================*
*                                                                                            *
**********************************************************************************************
 Harshit Symbol: X
 Cheeko_Boyee Symbol: O

**********************************************************************************************
*                                                                                            *
*                                                                                            *
*                                  _______ _______ _______                                   *
*                                 |       |       |       |                                  *
*                                 |   1   |   2   |   3   |                                  *
*                                 |-------|-------|-------|                                  *
*                                 |   4   |   5   |   6   |                                  *
*                                 |-------|-------|-------|                                  *
*                                 |   7   |   8   |   9   |                                  *
*                                 |_______|_______|_______|                                  *
*                                                                                            *
*                                                                                            *
**********************************************************************************************


                                Enter Your Choice Harshit (X) :
```

t tyagi\Desktop\9999\Tic Tac Toe\bin\Debug\ttt.exe

```
*************************************************************************************************
*                                                                                               *
*========================== I I M T COLLEGE OF ENGINEERING ===================================*
*                                                                                               *
*========================= MINI PROJECT BASED ON C PROGRAMMING ================================*
*                                                                                               *
*======================================== WELCOME ================================================*
*                                                                                               *
*************************************************************************************************
*=================== T    i   c ------- T   a   c -------- T   o   e ======================*
*                                                                                               *
*============================ A Project By : HARSHIT TYAGI ====================================*

 Harshit Symbol: X
 Cheeko_Boyee Symbol: O

*************************************************************************************************
*                                                                                               *
*                                                                                               *
*                                  _____________________                                        *
*                                 |     |     |     |                                         *
*                                 |  1  |  2  |  3  |                                         *
*                                 |-----|-----|-----|                                         *
*                                 |  4  |  X  |  6  |                                         *
*                                 |-----|-----|-----|                                         *
*                                 |  7  |  8  |  9  |                                         *
*                                 |_____|_____|_____|                                         *
*                                                                                               *
*                                                                                               *
*************************************************************************************************


                                Enter Your Choice Cheeko_Boyee (O) :
```

```
 Harshit Symbol: X
 Cheeko_Boyee Symbol: O

*************************************************************************************************
*                                                                                               *
*                                                                                               *
*                                  _____________________                                        *
*                                 |     |     |     |                                         *
*                                 |  O  |  X  |  X  |                                         *
*                                 |-----|-----|-----|                                         *
*                                 |  O  |  X  |  X  |                                         *
*                                 |-----|-----|-----|                                         *
*                                 |  O  |  O  |  9  |                                         *
*                                 |_____|_____|_____|                                         *
*                                                                                               *
*                                                                                               *
*************************************************************************************************

*************************************************************************************************
*                                                                                               *
*                                    The WINNER is : O                                          *
*-----------------------------------CONGRATULATIONS!!-------------------------------------------*
*                                                                                               *
*************************************************************************************************
*************************************************************************************************
*                                                                                               *
*-----------------------------------THANKS FOR PLAYING ------------------------------------------*
*                                                                                               *
*************************************************************************************************
*   Press 1     : To play Again.                                                                *
*   Press 2     : To Rename Player.                                                             *
*   Press 3     : To go back to Previous Menu.                                                  *
*   Press 4     : To go back to Main Menu.                                                      *
*   Press 5     : To Quit.                                                                      *
*************************************************************************************************
    Choice      :
```

References:

- www.playgroundequipment.com
- www.lifehack.org
- www.ukessays.com
- en.wikipedia.org
- indiancybersecuritysolutions.com
- eclipse.gsfc.nasa.gov
- www.slideshare.net
- www.geeksforgeeks.org
- stackoverflow.com