NATIONAL UNIVERSITY OF HO CHI MINH CITY

TICTACTOE PROJECT REPORT

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INTRODUCTION TO PROGRAMING

1 ABSTRACT

- This Document include the report of Project - Tictactoe Game .

- This Project 2 has completed as version Expert.

- Special library is windows.h and #pragma comment(lib, "winmm.lib") for adding music.

- Windows OS for running

- Use Super_Mario.wav for music.

Contents

2   CHAPTER 1: GAME TUTORIAL

The tutorial of the tictactoe game:

- Firstly, there will be the beginning introduction ask you to play game or quit, if choose press spacebar button.

- Then you wil go to the Menu select with 3 option: Tutorial, Play Game and Quit. Choose tutorial will lead you to the guidance of the game, choose playgame to continue, choose quit to end the game.

- You choose to play sound during the game or not.

- You can choose between playing with person (PVP) or enrivonment (PVE).

- Input your name and your opponent's name.

- Input size of tictactoe board (N*N) (up to you).

- Input the winning check that you want, but it must be less or equal than the size.

- SPECIALLY, you can input the restricted time for each player to make the game harder.

- Input your icon and opponient's icon to the game.

- Choose the text and background color for your game. Done, and you can enjoy the game.

- The goal of this game is to achieve highest streak in one horizontal line or vertical line or diagonal line which equal than the winning check point.

- Player 1 will go first.

- The time restricted will countdown each move.

- During the game there will be some hints for each player.

- The first player get the right winning check will be the winner , do not enter the chosen coordinate.

- If player insert wrong coordinate, the system will ask to insert again.

- If the board is filled and none player win , there will be count as a draw match.

- The statistic will be print after each match.

- Finally, you can choose to play again as you want. If choose to play again, the system will save the previous statistic.

Here is the specific tutorial in the game:

```
================== TUTORIAL FOR THE TICTACTOE GAME  ================= =====

+ Firstly, you choose to play sound during the game or not.

+ You can choose between playing with person (PVP) or enrivonment (PVE).

+ Input your name and your opponent's name.

+ Input size of tictactoe board (N*N) (up to you).

+ Input the winning check that you want, but it must be less or equal than the size.

+ SPECIALLY, you can input the restricted time for each player to make the game harder.

+ Input your icon and opponient's icon to the game.

+ Choose the text and background color for your game. Done, and you can enjoy the game.

+ The goal of this game is to achieve highest streak in one horizontal line or vertical line or diagonal line which equal than the win

+ Player 1 will go first.

+ During the game there will be some hints for each player

+ The first player get the right winning check will be the winner , do not enter the chosen coordinate.

+ If player insert wrong coordinate, the system will ask to insert again.

+ If the board is filled and none player win , there will be count as a draw match.

+ The statistic will be print after each match.

+ Finally, you can choose to play again as you want.


        Do you get it ? Now let's play!!!!!!!!!
```
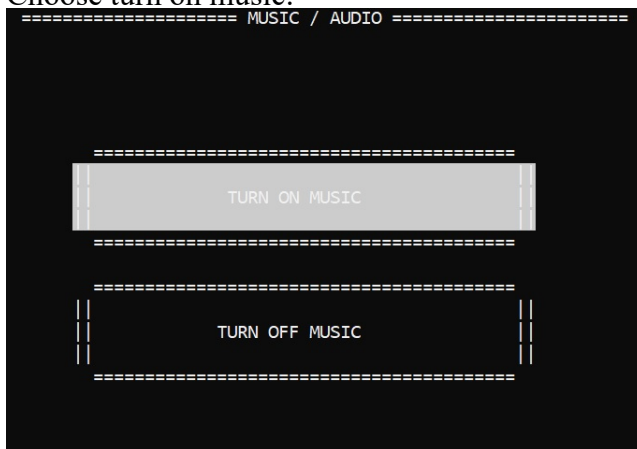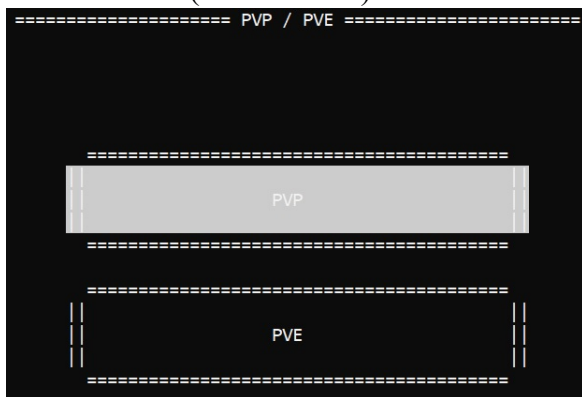
Other pictures :
The beginning introduction:

Choose turn on music:

Choose mode (PVP or PVE):

Setting display:

During playing the game display:

```
     1         2         3         4         5
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 1 |       ||        ||    #   ||        ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 2 |       ||        ||        ||        ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 3 |       ||        ||        ||        ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 4 |       ||        ||    $   ||        ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 5 |       ||        ||        ||        ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
!!Hints for H: You can choose the coordinate (2, 5).
H turn
H has 19 time left
 Input the Row coordinate ( number ) = _
```
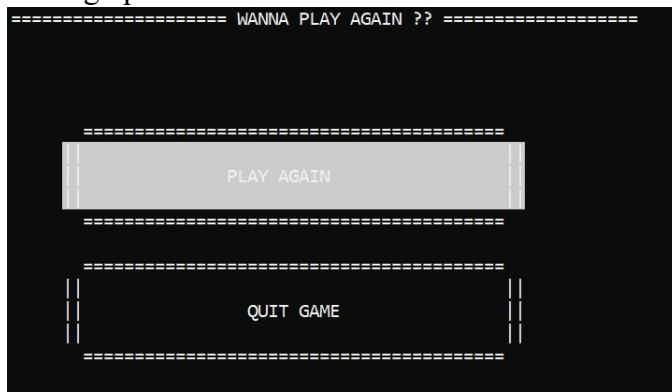
Winning and statistic display:

```
     1         2         3         4         5
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 1 |   #   ||   #    ||   #    ||   $    ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 2 |   $   ||   $    ||   #    ||        ||   #    |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 3 |       ||   $    ||        ||   $    ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 4 |       ||   #    ||   $    ||        ||   #    |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
   --------- --------- --------- --------- ---------
   |       ||        ||        ||        ||        |
 5 |       ||        ||        ||   $    ||        |
   |       ||        ||        ||        ||        |
   --------- --------- --------- --------- ---------
Nguyen A Won this match
 Number of match played : 1
 Number of match player  H win: 0
 Percentage the player  H win:  0%
 Number of match player  Nguyen A win: 1
 Percentage the player  Nguyen A win:  100%
 Number of match Draw is : 0
Press any key to continue . . . _
```

Ending option:

3   CHAPTER 2: SOURCE CODE DESCRIPTION

3.1   STRUCTURES FOR TICTACTOE GAME

Including 4 structures:

- Point : include horizontal and verrtical point for a board.

- Suggestion : include row and collumn need for Suggesting Functions.

- Information : include main informations for each player such as: playername, icon, winning, Point Coordinate,...

- Tictactoe : include the main informations nead for the board such as: size, Backgroundcolor, Textcolor, wincheck, count-draw, Information player,....

3.2   PRINT BOARD FUNCTIONS

The Print Board Functions include:

- Print_horizontal_coordinates : to print the exactly coordinate in each col.

- Print_horizontal_line : to print the completely board.

- Print_vertical_line : to print the completely board.

- Print_Board : combine with 3 above functions to print a completely board with the coordinate and what player move.

3.3   RANDOM FUNCTIONS FOR PVE

The Random Functions are used for setting PVE mode that playing automatically:

- random_PVE : to give a randomly number in range.

3.4   SUGGESTING FUCTIONS

The Suggesting Functions are used for help player to move when they need :

- SuggestionPlayer1 : to give a randomly coordinate different from the chosen box for player 1 to play.

- SuggestionPlayer2 : to give a randomly coordinate different from the chosen box for player 2 to play.

3.5   INPUT FUCTIONS

The Input Functions are used for complete all information need in the game by the input of player :

- Init_Playername : use for input the name of both player.

- Init_PVE_Playername : automatically set the name for the bot player.

- Init_Restricted_Time : use for input the restricted time for both player.

- Init_Board : use for set the board clear, empty to start the game.

- Input_XPlayer_Turn : use for player 1 to input the coordinates of his/her move and also check if it is a valid move or not.

- Input_Environment_Player_Turn : use for player bot automatically set its coordinates that does not similar to the other previous moves.

- Input_OPlayer_Turn : use for player 2 to input the coordinates of his/her move and also check if it is a valid move or not.

- BackgroundColor : use to set the text and the background color of the match.

- Setting_Color : combine with the BackgroundColor fuction and let the player input to set the color.

3.6   CHECK WIN FUCTIONS

The Check win Functions are used for make sure the player can win with the right check win point and also check draw :

- Check_Horizontal_Winner : use for checking if there are any consecutive characters in a horizontal line or not.

- Check_Vertical_Winner : use for checking if there are any consecutive characters in a verrtical line or not.

- Check_Diagonal_Winner : use for checking if there are any consecutive characters in a diagonal line or not.

- Check_Vice_Diagonal_Winner : use for checking if there are any consecutive characters in a vice diagonal line or not.

- Check_Above_Diagonal_Winner : use for checking if there are any consecutive characters in a above diagonal line or not.

- Check_Below_Diagonal_Winner : use for checking if there are any consecutive characters in a below diagonal line or not.

- Check_Above_Vice_Diagonal_Winner : use for checking if there are any consecutive characters in a above vice diagonal line or not.

- Check_Below_Vice_Diagonal_Winner : use for checking if there are any consecutive characters in a below vice diagonal line or not.

- Check_Winner : combine with above functions to make the completely check win function that true with all case of N*N board.

- Draw_Game : use for check if the board has no move space to move or not and will draw if there isn't any space else.

3.7   RESULT FUCTIONS

The Result Functions are used for combine all the functions above to a clear function that contain everything need for the game:

- PlayGame : include the input functions, print board functions, check win functions,.... and combine them into a make sense match.

- Count_Statistic : output all the information when match end: win percentage, draw percentage, who win the most, match played,...

3.8   TUTORIAL FUCTION

- Tutorial : show specificly all the guidances for the game.

3.9   OTHER GAME'S INTRO FUCTIONS

- gotoxy : to move the cursor to the exactly coordinate.

- INTRO and INTRO_NEXT : To show the beginning of the game including menu, options,...

- ENDING : To ask if the player want to play again or not.

- Music : To ask the player want to play music or not.

- PVE : To ask which option player choose between PVP and PVE mode.

- Init_Setting : Include some functions in INPUT FUNCTIONS and require player to input information.

4   REFERENCES

This Tictactoe game was completed thanks to the supporting from:

- Starting Out with C++ from Control Structures to Objects 8th Edition by TONY GADDIS

- The suggestion from Mr. Thong and Mrs. Nhi.

- The ideas from the code of Mr. Thong each pratical class.

- Gotoxy supporting :`https://www.youtube.com/watch?v=fOW0Fgqx3XU` for the gotoxy function in the game.

- Music setting : `https://daynhauhoc.com/t/long-nhac-mp3-vao-u 34035` for adding music into the game.