**TIC TAC TOE**

**FINAL REPORT SS1**

1. ***Introduction***
2. ***Purpose***

Tic-Tac-Toe game can be played by two players where the square block (9 x 9) can be filled with a cross (X) or a circle (O). The game toggles between the players by giving the chance for each player to mark their move. When one of the players make a combination of 5 same markers in a horizontal, vertical or diagonal line the program will display which player has won, whether X or O. Games in general provide a real source of enjoyment in daily life. They are also very helpful in improving the physical and mental health of human. In this project, we’ll build an interactive tic-tac-toe game with Python. The goal of this project is to help us understand Python and its syntax.

1. ***Role of each member***

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| **Strengths** | **Weaknesses** |
| * We all have basic knowledge about Python and prepare plan carefully to conduct this project. * We has coding skill in our group so he takes responsible for implementing the main function * We are good at color scheme so that they do GUI * We has duty for “leader board” | * Our knowledge still limit especially when applying some algorithms to build methods. |
| **Opportunities** | **Threats** |
| * We are able to build a simple game but gain a lots knowledge | * This program could have some problem when running. Processing speed might be low. |

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1. ***Main functions***
2. ***Describe each function***
3. Game file: playboard.py is the game board that enables players to play Tic-Tac-Toe

* \_\_init\_\_ (self): a reserved method in python classes. It is called as a constructor. In addition, it has a cycle function which makes the board change between X and O automatically.
* get\_moves ( ): let each player makes their move on the board. This function returns the move of the player from the on\_click ( ) function.
* on\_click ( ): a sub function inside get\_moves ( ); print the player’s move on the board, update the board and then use 2 functions has\_won ( ) and is\_draw ( ) to decide which player wins the game.
* create\_board ( ): create game board with a dimension of 9x9 (can be changed) using for loop.
* is\_draw ( ): check if all buttons on board are filled by “X” and “O” or not.
* has\_won ( ): check if player has the winning combinations in the game board (horizontal, vertical or diagonal 5 in a row); return true if the player has the winning combinations, false if not
* has\_combination ( ): a sub function inside has\_won ( ); check all the possible winning combinations on the board and return them if any.

1. Menu file: test.py is the UI of the Tic-Tac-Toe game. It has 4 choices: New game, Leaderboard, Instruction and Exit.

* \_\_init\_\_ (self): a reserved method in python classes. It is called as a constructor. In here, the main UI of the class is created.
* show\_rules ( ): print the game’s rule using tkinter “messagebox” method.
* choose\_mode ( ): let player chooses which mode to play game: play with bot, 1v1.
* one\_player\_mode ( ): a sub function inside choose\_mode ( ), it enables player to play with computer (bot mode).
* two\_play\_mode ( ): a sub function inside choose\_mode ( ), it enables player to play with another one (1v1 mode).
* play ( ): a function that calls the game.py file after the player clicks “Start” button inside choose\_mode ( ) function.
* score\_check ( ): show the leaderboard of all the players that have played and game as well as their wins. (not yet finished)

c) Main.py : This file is the place where user goes to after login.

* \_\_init\_\_(self,id): a reserved method in python classes. It is called as a constructor. In here, the main UI of the class is created. If the user has not logged in yet, it will redirect to the login.py
* Play(): Go to test.py file
* Changepwd(): go to change password form
* UpdateInfo(): go to change profile picture form
* Logout(): Sign out and go login form

d) rsl.py:

* \_\_init\_\_(self,pname='',Winner='',isDraw = False): This function is used to display the result of the match

e) The user management files: This part contains 4 file: login.py, register.py, changepwd.py, updateImage.py. Each file has its own function

* updateImage.py:
  1. update(img,id): This function is used to update the profile photo of user
  2. getImg(id): This fuction is used to get the current profile photo of user to display
  3. Back(): Come back to main page
* Changepwd.py:
  1. changePwd(oldPass,rePass, newPass): This is used to change user’s password. After the validation is completed, The update query will be executed and update the new password to the database
  2. readFile(): This is used to get the current id logged user. From that id, we can get the old password and compare with the one user input
  3. Back() : Back to the main page
* Register.py:
  1. Register(username, password,img): This function is used to register new user to the system. It has 2 parts: validate information and insert to the database
  2. Back(): This’s used to come back to login page
* Login.py:
  1. \_\_init\_\_ (self): a reserved method in python classes. It is called as a constructor. In here, the main UI of the class is created. If the user has already login, it will redirect to the main.py
  2. validateLogin(username,password): This function is used to validate the user’s input. If the the user’s information is valid and after the select query is executed successfully , user will login to the system and change to the main.py
  3. register() : This function is used to redirect to the register form
  4. writeFile(content): After the user has logged in, this function will be executed to write the user’s id to the file to save the login session.

1. ***Describe how to create GUI***

* Main Menu: using three main frames icon\_frame, title\_frame and option\_frame.

1. icon\_frame: the main frame which contains the game title, we use font “fixedsys” with background color “lightpink”, foreground “#ffffff”.
2. title\_frame: the label for “X” and “O” (decoration purposes). We use the font “Comic sans ms” with background colour “whitesmoke”, and foreground “lightpink” to change colour when a button is chosen.
3. option\_frame: a frame to hold four main buttons (“NEW GAME”, “LEADER BOARD”, “INSTRUCTION”, “EXIT”)

* Choose mode: using five frames title, mode, player1\_frame, player2\_frame and start\_cancel

1. title: a simple sentence asking how many players do user wants to play.
2. mode: player can choose 1 player or 2 players inside it.
3. player1\_frame: a frame to let player 1 enter the name inside.
4. Player2\_frame: a frame to let player 1 and player 2 enter the name inside.
5. start\_cancel: contains 2 button “Start” (to play the game) and “Main Menu” to go back to the Menu.

* Leaderboard: using 4 frames cover\_frame, title\_frame, table\_frame (with 4 sub frames), btn\_frame

1. cover\_frame: grab all the frames together (decoration purposes).
2. title\_frame, table\_frame: combines together to make a table holding every player with their names and number of wins
3. btn\_frame: a “Main Menu” button to go back to the Menu

* The user management files:

1. Label: label for input information
2. Entry: input for user
3. Button : Submit the form
4. ***Future work***

Function “one\_player” playing with computer which must use AI to implement code. We did not complete because we do not understand fully minimax algorithm. We also searched some example for 3x3 dimension to get idea but calculating score when player move is hard with large dimension. In addition, the part when user wants to export the leaderboard to a csv file is still in progress. Our group doesn’t have enough time to do.

1. ***Conclusion***

Through this project, we do gain many skills including knowledge. Based on details plan, each member can follow the work, and we are a good team. We always support each other when having problems, therefore teamwork skill is developed and gradually completed. Communication skills is improved because we exchange information every day and discuss very often to get the best result.

After finishing this course, we have learnt a new language “Python” which is very popular in the world. Thanks to guide carefully of our instructor, each lecture is easy to understand and we able to remember lesson in class. Moreover, each lesson has tutorial which is designed extremely suitable to practice.