

Marking Scheme of Project

ENGG 1110 Problem Solving by Programming (21/22R1)

2 Human Player:

1. Handle the number of players
 - 2 players: 2 human players 2%
2. Print the game board correctly
 - a. O and X 2%
 - b. The pattern of multiple | and numbers 2%
3. Handle user inputs for placing human player marks
 - Valid input: An integer between 1 and 7
 - a. The correct mark (O or X) appears in the specified column 2%
 - b. The mark appears on the top of the existing marks 2%
 - Invalid input: An integer not within 1 to 7
 - c. Correct error message, not update the game board 2%
 - d. Read the next input until the input is valid 2%
 - Invalid input: Try to place a mark in a full column
 - e. Correct error message, not update the game board 2%
 - f. Read the next input until the input is valid 2%
4. Players can play in turns to the end of the game
 - Player 1 → Player 2 → Player 1 → Player 2 → ... → End 4%
5. End game
 - a. Draw game and correct draw game message 4%
 - b. Winning conditions for horizontal 4%
 - c. Winning conditions for vertical 4%
 - d. Winning conditions for diagonal 4%
 - e. No incorrect winning conditions during testing 4%
 - ◆ E.g., win by OOO, XXX, or OXXO, etc.
 - ◆ Marks only given when there is at least one full mark (4%) in (b), (c), or (d)
 - f. When the last move wins the game, it is a win but not a draw 4%
 - g. Correct winning message (Player 1 and Player 2) 2%
 - h. The program terminates afterwards 2%

1 Human Player, 1 AI computer player:

1. Handle the number of players
 - a) 1 player: 1 human player + 1 computer player 2%
 2. Print the game board correctly
 - a) and X 2%
 - b) The pattern of multiple | and numbers 2%
 3. Players can play in turns to the end of the game
 - Player 1 → Computer → Player 1 → Computer → ... → End 4%
 4. Correct implementation of the computer player AI
 - a) Winning move of the computer player
 - i) Normal case (only one winning move exists) 4%
 - ii) Tie case: the one with a smaller column number is chosen 4%
 - iii) Not mess up the existing marks on the game board Note 1 4%
 - b) Block the winning move of the human player
 - i) Normal case (only one winning move exists) 4%
 - ii) Tie case: the one with a smaller column number is chosen 4%
 - iii) Not mess up the existing marks on the game board Note 1 4%
 - c) No winning moves for both players, place at the column with the fewest marks
 - i) Normal case 4%
 - ii) Tie case: the one with a larger column number is chosen 4%
 - iii) Not mess up the existing marks on the game board Note 1 4%
- Note 1: The marks for (iii) cannot exceed the marks for (i)+(ii).*
- E.g.1, if (i)+(ii) scores 0, no mark will be given for (iii)*
- E.g.2, if (i)+(ii) scores 2, max. score for (iii) is 2*
- E.g.3, if (i)+(ii) scores 4 to 8, max. score for (iii) is 4*
5. End game
 - a) Correct winning message (Player 1 and Computer) 2%
 - b) The program terminates afterwards 2%