# Design and implementation Document

**I decided to use the Python language with object-oriented paradigms to implement the modified tic-tac-toe program. Below is the class diagram of the modified tic-tac-toe programme.**

A screenshot of a computer program

Description automatically generated

Figure - Class diagram of tic-tac-toe

**In Figure 1 I have shown the class diagram, so I have followed the class diagram written on each function below:**

**Game class:**

1. \_\_init\_\_ Function

A screen shot of a computer program

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Figure - \_\_init\_\_function in game class

1. Switch Players Function

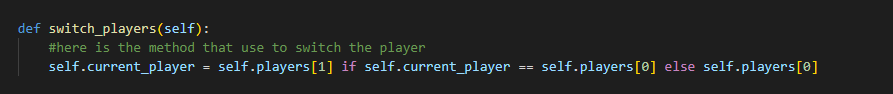


Figure - Switch players function in game class

1. Play Game Function

A computer code on a black background

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Figure - Play game function in game class

1. Display Function

A screen shot of a computer program

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Figure - Display function in game class

1. Make Move Function

A screen shot of a computer code

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Figure - Make move function in game class

1. Check Winner Function

A screen shot of a computer code

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Figure - Check Winner function in game class

**Board class:**

1. Display Function

A computer screen shot of text

Description automatically generated

Figure - Display Function in board class

1. Winner Function

A computer code on a black background

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Figure - Winner function in board class

1. Valid Move Function

A computer screen with text

Description automatically generated

Figure - Is\_valid\_move function in board class

1. Make Move Function

A screen shot of a computer code

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Figure - Make move function in board class

**Player class:**

1. \_\_init\_\_ Function

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Figure - \_\_init\_\_ function in player class

1. Make Move Function

A computer screen shot of a program code

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Figure - Make move function in player class

**In the iteration code of my implementation process, I wrote the following code:**

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Figure - Iteration code part 1

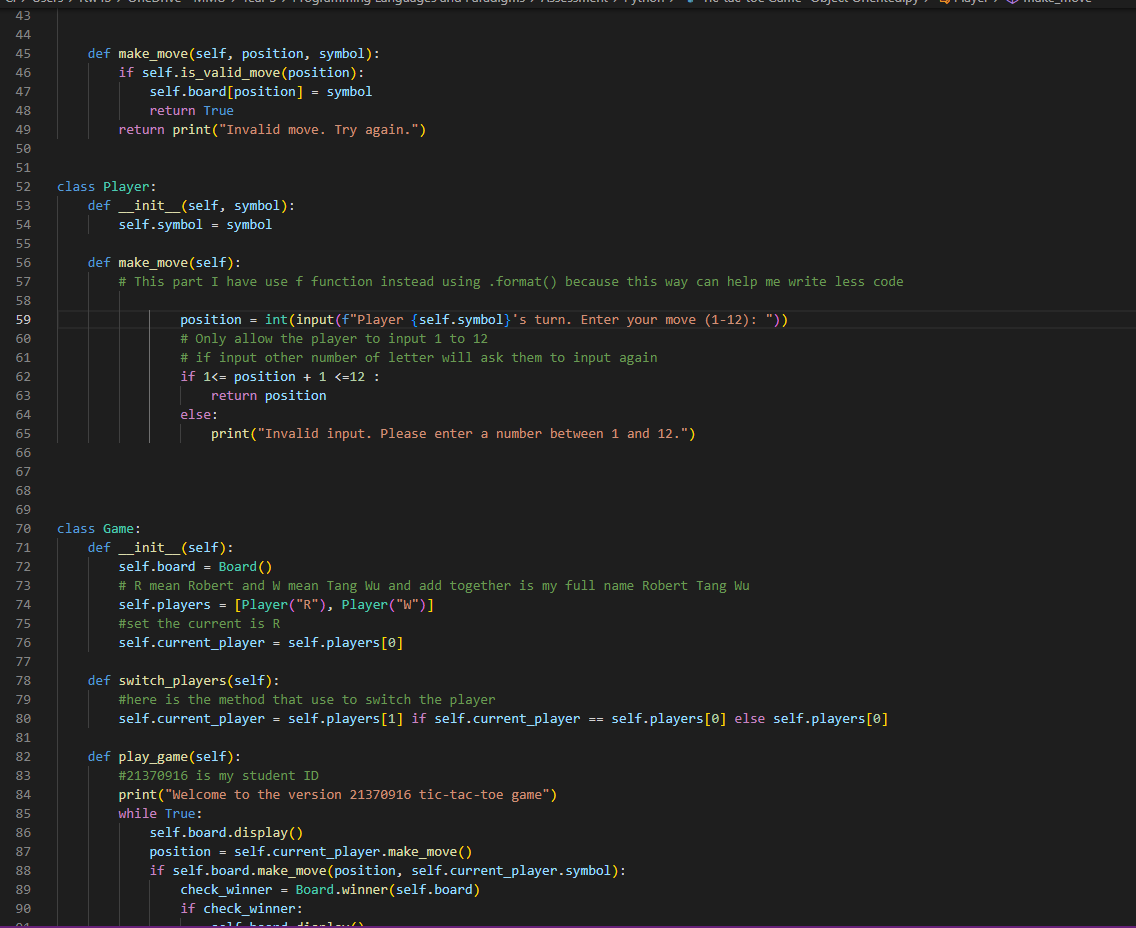


Figure - Iteration code part 2

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Figure - Iteration code part 3

**In the iteration of my implementation, I have found some error, so I have updated the code**

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Figure - The error of the code when input a letter

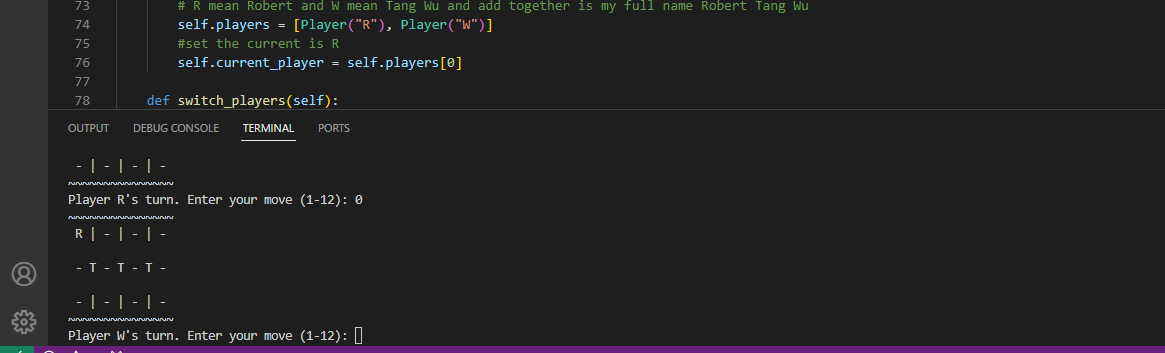


Figure -The error of the code the range should start from 1 to 12 not 0-11

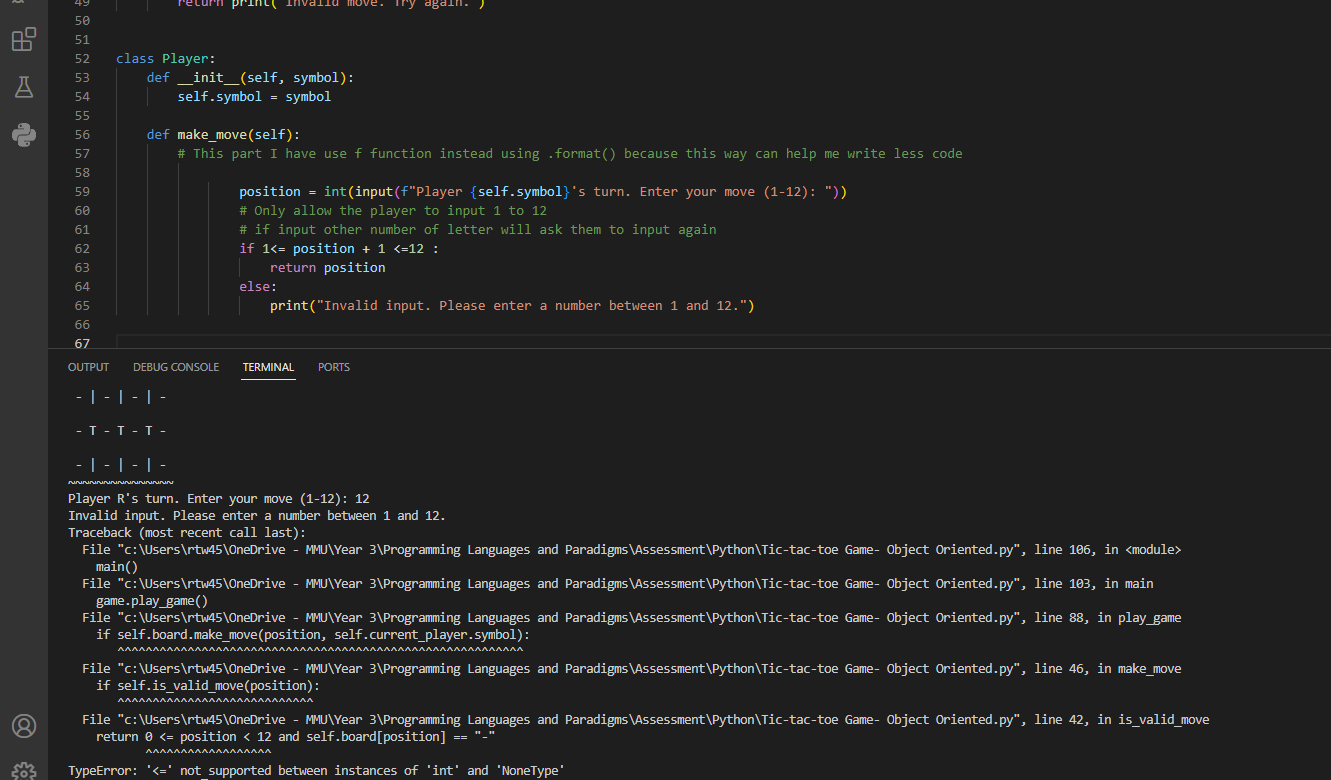


Figure - The error of the code when input the number that out of range

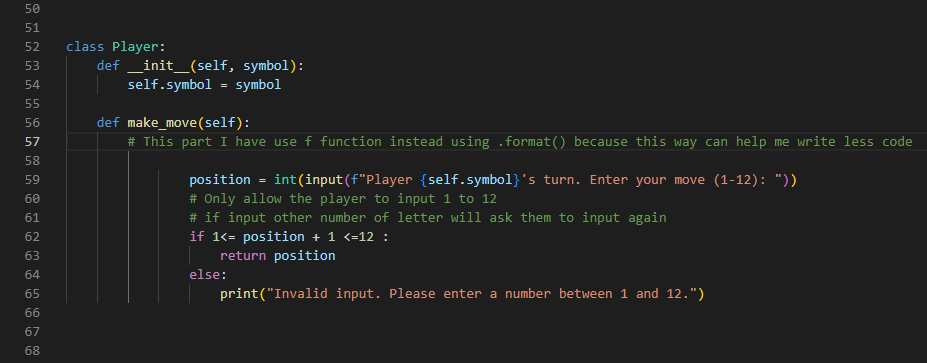


Figure - Found the issue from the code

A computer screen shot of a program code

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Figure - Updated the code

A black background with blue and green lines

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Figure - After update the code the result of the input a letter

A computer screen shot of a program

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Figure - After update the code the result of the input a number that out of range

**When the whole program working, and I have tested the programming. These are the tests that I conducted:**

1. Run to the end with R player winning

A screen shot of a computer

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Figure - Test R player wining (col)

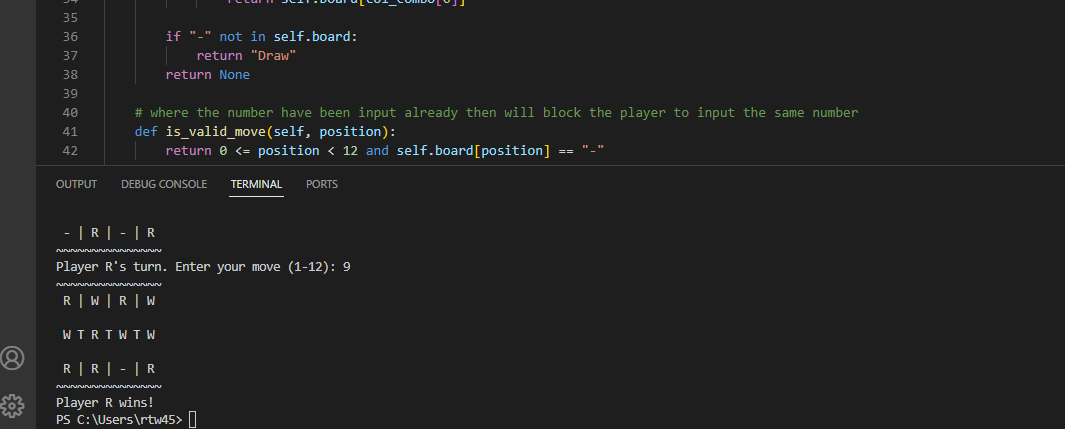


Figure - Test R player wining (diagonal)

A black screen with white text

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Figure - Test R player wining (row)

1. Run to the end with W player winning

A screenshot of a computer program

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Figure - Test W player wining (col)

A screen shot of a computer

Description automatically generated

Figure - Test W player wining (diagonal)

A black screen with white text

Description automatically generated

Figure - Test W player wining (row)

1. Run to the end with a draw.

A screen shot of a computer

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Figure - Test the game draw

1. Validation of input the out-of-range number

A computer screen shot of a black screen

Description automatically generated

Figure - Test input out of range number

1. validation of input a letter

A computer screen with white text

Description automatically generated

Figure - Test input a letter

1. Validation of input of the symbol to the cell that already exists

A screenshot of a computer program

Description automatically generated

Figure - Test input of the symbol to the cell that already exists