Assignment 002 (2020)

Rock-Paper-Scissors Game

Use Visual Studio to create a Console App Project (主控台應用程式) and name the project name (名稱) and Solution Folder Name (方案名稱) as <yourID><YourName>Ass02. Then add a new Windows App Project (視窗應用程式) to the solution(方案).

***** Instructions **********

1. Create a rock-paper-scissors game for users to play with computer.

2. Develop both Console and Win applications.

Console App:

1. Prepare three counters (int type; integer) to count won, tied, and lost times for the user. These variables should be defined as members of the enclosing class (not local variables in a function) so every function can access them directly. For the Console project, they should be declared as class-scope data by adding “static” modifier for the static function Main() to access them.

2. Prepare two variables (int type, char type, or string type) to represent the hands of the user and computer. Suggestion: int type for computer’s hand since computer is able to generate random numbers; string type for player’s hand.

3. In your Console application, repeating processing is required to print out the current status and to ask user place another hand. Try to define a static function that updates the content of your score board (e.g, DisplayScoreBoard()), which can be repeatedly called when each game is played. You need to use C# looping statement:

```
do
{
…
} while ( loopingConditionIsTrueExpression );
```

Suggestion for `loopingConditionIsTrueExpression`: using Console.ReadLine() to read in user's intention; e.g., prompt "Continue? y/n" to get entered string "y" or "n" stored in a variable `answer` and `loopingConditionIsTrueExpression` could be `answer == "y"`.

4. You need to use `if-else` statement to check and compare the hands to decide who wins the game and accordingly update the counters.

C# if statement:

```
if( boolValue )
{
    // statement executions for true case
}
else
{
    // statement executions for false case
}
```

Comparison expression returns a `bool` value (value is either true or false)

C# equality operator: `==`

C# not equal operator: `!=`

C# larger operator: `>`

C# smaller operator: `<`

5. You need to create an object of `Random` class to generate random number to simulate the hand played by the computer. You cannot use the class directly; instead, a user named object of the `Random` class is instantiated to have its own seed for random number generation (seed is a number to yield a series of pseudo random numbers).

Sample statements:

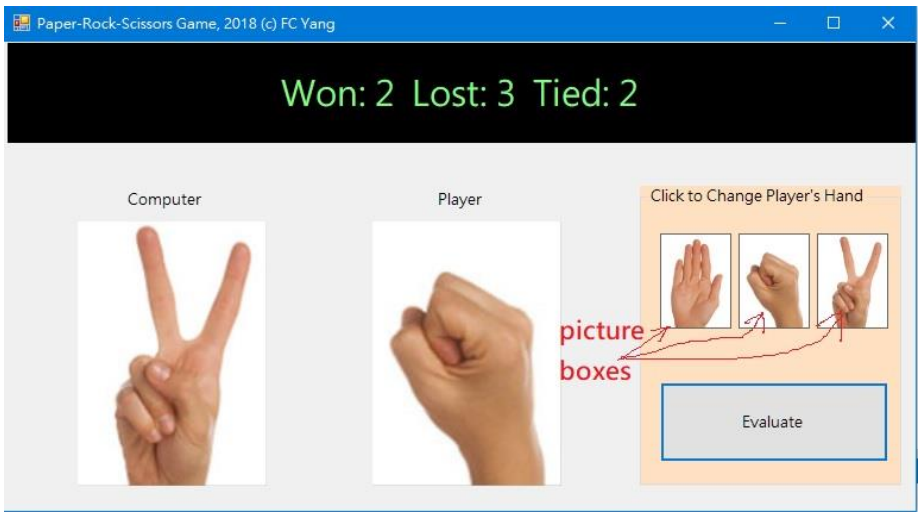
```
Random myRandomNumberGenerator = new Random();
int computerHand = myRandomNumberGenerator.Next( 3 );
```

The "new" is an operator of the C# programming language to allocate memory for an object and return its *reference* (address) back to the caller. Argument 3 is the upper limit for integers generated; i.e., only 0, 1, and 2 will be returned.

6. Play around with the available static functions of the Console class.

Win App:

1. From your experience, design an attractive graphics user interface for the game.
2. Try to use PictureBox control to indicate the user's and computer's hand.
3. Find image files from the internet and add them to your executable as resources. Set the Image property of the PictureBox to reflect the user's and computer's hand.
4. Write a function that display the game scores.



Note:

1. Compile and modify your code until it is executed successfully.

2. Append as many comments as possible to get high score.

Compress the solution folder as <yourIDYourName>Ass02.rar or <yourIDYourName>Ass02.zip

Login course web site using your account and submit the archived file to this assignment page before the due date.