OOP (Object Oriented Programming) Lab

LAB REPORT # 2

Semester: 2nd Semester

Section: C

Submitted To:

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Task 1:

```cpp
#include <iostream>
#include <string>
#include <random>
#include <time.h>

using namespace std;

int main()
{
    srand(time(0));

    int A[100];

    for (int i = 0; i < 100; i++)
    {
        A[i] = rand();
    }

    int max = A[0], min = A[0];

    for (int i = 0; i < 100; i++)
    {

        if (A[i] > max)
            max = A[i];

        if (A[i] < min)
            min = A[i];
    }

    cout<<"Max number is : "<<max<<endl;
    cout<<"Min number is : "<<min<<endl;
    return 0;
}
```

Output:

```
Max number is : 32766
Min number is : 41
```

Task 2:

```cpp
#include <iostream>

using namespace std;

void drawBoard(char b[3][3], char Cplayer)
{
    cout << "                          column 0          column 1          column 2      " << endl;
    cout << "                                      |              |              " << endl;
    cout << "       row 0              " << b[0][0] << "         |          " << b[0][1] << "         |          " << b[0][2] << "          " << endl;
    cout << "                                      |              |              " << endl;
    cout << "                 -------------------------------------------------------" << endl;
    cout << "                                      |              |              " << endl;
    cout << "       row 1              " << b[1][0] << "         |          " << b[1][1] << "         |          " << b[1][2] << "          " << endl;
    cout << "                                      |              |              " << endl;
    cout << "                 -------------------------------------------------------" << endl;
    cout << "                                      |              |              " << endl;
    cout << "       row 2              " << b[2][0] << "         |          " << b[2][1] << "         |          " << b[2][2] << "          " << endl;
    cout << "                                      |              |              " << endl;
    cout << "\n\n\n";
    cout << "Current Player is :" << Cplayer;
    cout << "\n\nEnter your location (row column) : ";
}

void drawFBoard(char b[3][3])
{
    system("cls");
    cout << "                          column 0          column 1          column 2      " << endl;
    cout << "                                      |              |              " << endl;
    cout << "       row 0              " << b[0][0] << "         |          " << b[0][1] << "         |          " << b[0][2] << "          " << endl;
    cout << "                                      |              |              " << endl;
    cout << "                 -------------------------------------------------------" << endl;
    cout << "                                      |              |              " << endl;
    cout << "       row 1              " << b[1][0] << "         |          " << b[1][1] << "         |          " << b[1][2] << "          " << endl;
    cout << "                                      |              |              " << endl;
    cout << "                 -------------------------------------------------------" << endl;
    cout << "                                      |              |              " << endl;
    cout << "       row 2              " << b[2][0] << "         |          " << b[2][1] << "         |          " << b[2][2] << "          " << endl;
    cout << "                                      |              |              " << endl;
}


bool checkWinner(char b[3][3])
{
    // horizontal win
    if (b[0][0] == b[0][1] && b[0][1] == b[0][2] && b[0][2] != ' ')
    {
        drawFBoard(b);
        cout << "Winner is : " << b[0][1] << endl;
        return true;
    }
    else if (b[1][0] == b[1][1] && b[1][1] == b[1][2] && b[1][2] != ' ')
    {
        drawFBoard(b);
        cout << "Winner is : " << b[1][1] << endl;
        return true;
    }
    else if (b[2][0] == b[2][1] && b[2][1] == b[2][2] && b[2][2] != ' ')
    {
        drawFBoard(b);
        cout << "Winner is : " << b[2][1] << endl;
        return true;
    }
    // vrtical win
    else if (b[0][0] == b[1][0] && b[1][0] == b[2][0] && b[2][0] != ' ')
    {
        drawFBoard(b);
        cout << "Winner is : " << b[1][0] << endl;
        return true;
    }
    else if (b[0][1] == b[1][1] && b[1][1] == b[2][1] && b[2][1] != ' ')
    {
        drawFBoard(b);
        cout << "Winner is : " << b[1][1] << endl;
        return true;
    }
    else if (b[0][2] == b[1][2] && b[1][2] == b[2][2] && b[2][2] != ' ')
    {
        drawFBoard(b);
        cout << "Winner is : " << b[1][2] << endl;
```

```cpp
            return true;
        }
        // diagnal win
        else if (b[0][0] == b[1][1] && b[1][1] == b[2][2] && b[2][2] != ' ')
        {
            drawFBoard(b);
            cout << "Winner is : " << b[1][1] << endl;
            return true;
        }
        else if (b[0][2] == b[1][1] && b[1][1] == b[2][0] && b[2][0] != ' ')
        {
            drawFBoard(b);
            cout << "Winner is : " << b[2][2] << endl;
            return true;
        }
    else
        return false;
}

int main()
{

    char board[3][3] = {
        {' ', ' ', ' '},
        {' ', ' ', ' '},
        {' ', ' ', ' '}};
    bool boardAvailable[3][3] = {
        {true, true, true},
        {true, true, true},
        {true, true, true}};
    char CPlayer, player1 = 'X', player2 = 'O';
    bool GameOver = false;
    CPlayer = player1;
    int row, col;

    while (!GameOver)
    {
    getinput:
        system("cls");
        drawBoard(board, CPlayer);
        cin >> row >> col;
        if (boardAvailable[row][col])
        {
            if (row < 3 && col < 3 && row > -1 && col > -1)
            {
                board[row][col] = CPlayer;
                boardAvailable[row][col] = false;
            }
            else
            {
                cout << "Row and Column is wrong ReEnter :( (Press Enter to continue)";
                cin.ignore();
                cin.ignore();
                goto getinput;
            }
        }
        else
        {
            cout << "Place Occupied ReEnter :( (Press Enter to continue)";
            cin.ignore();
            cin.ignore();
            goto getinput;
        }
        if (CPlayer == player1)
            CPlayer = player2;
        else
            CPlayer = player1;

        if (checkWinner(board))
            GameOver = true;
    }

    return 0;
}
```

Output:

```
                       column 0          column 1          column 2
                              |                 |
       row 0                  |        O        |
                              |                 |
            -------------------------------------------------------------
                              |                 |
       row 1                  |                 |
                              |                 |
            -------------------------------------------------------------
                              |                 |
       row 2                  |                 |        X
                              |                 |


Current Player is : X

Enter your location (row column) : █
```

```
                    column 0          column 1          column 2
                           |                 |
       row 0               |                 |
                           |                 |
          -------------------------------------------------------------
                           |                 |
       row 1      X        |        X        |        X
                           |                 |
          -------------------------------------------------------------
                           |                 |
       row 2      O        |                 |        O
                           |                 |
Winner is : X
```