



OOP (Object Oriented Programming) Lab

LAB REPORT # 2

Semester: 2nd Semester

Section: C

Submitted To:

Mr. Muhammad Husnain

Submitted By:

Name: Abdul Ahad

Roll No: 22-CS-071

Task 1:

```
#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:

```
1  #include <iostream>
2
3  using namespace std;
4
5  void drawBoard(char b[3][3], char Cplayer)
6  {
7      cout << ".....column 0.....column 1.....column 2....." << endl;
8      cout << "....." << endl;
9      cout << ".....row 0....." << b[0][0] << "....." << b[0][1] << "....." << b[0][2] << "....." << endl;
10     cout << "....." << endl;
11     cout << "....." << endl;
12     cout << "....." << endl;
13     cout << ".....row 1....." << b[1][0] << "....." << b[1][1] << "....." << b[1][2] << "....." << endl;
14     cout << "....." << endl;
15     cout << "....." << endl;
16     cout << "....." << endl;
17     cout << ".....row 2....." << b[2][0] << "....." << b[2][1] << "....." << b[2][2] << "....." << endl;
18     cout << "....." << endl;
19     cout << "\n\n\n";
20     cout << "Current Player is : " << Cplayer;
21     cout << "\n\nEnter your location (row column) : ";
22 }
23
24 void drawFBoard(char b[3][3])
25 {
26     system("cls");
27     cout << ".....column 0.....column 1.....column 2....." << endl;
28     cout << "....." << endl;
29     cout << ".....row 0....." << b[0][0] << "....." << b[0][1] << "....." << b[0][2] << "....." << endl;
30     cout << "....." << endl;
31     cout << "....." << endl;
32     cout << "....." << endl;
33     cout << ".....row 1....." << b[1][0] << "....." << b[1][1] << "....." << b[1][2] << "....." << endl;
34     cout << "....." << endl;
35     cout << "....." << endl;
36     cout << "....." << endl;
37     cout << ".....row 2....." << b[2][0] << "....." << b[2][1] << "....." << b[2][2] << "....." << endl;
38     cout << "....." << endl;
39 }
40
41
42 bool checkWinner(char b[3][3])
43 {
44     // horizontal win
45     if (b[0][0] == b[0][1] && b[0][1] == b[0][2] && b[0][2] != '.')
46     {
47         drawFBoard(b);
48         cout << "Winner is : " << b[0][1] << endl;
49         return true;
50     }
51     else if (b[1][0] == b[1][1] && b[1][1] == b[1][2] && b[1][2] != '.')
52     {
53         drawFBoard(b);
54         cout << "Winner is : " << b[1][1] << endl;
55         return true;
56     }
57     else if (b[2][0] == b[2][1] && b[2][1] == b[2][2] && b[2][2] != '.')
58     {
59         drawFBoard(b);
60         cout << "Winner is : " << b[2][1] << endl;
61         return true;
62     }
63     // vertical win
64     else if (b[0][0] == b[1][0] && b[1][0] == b[2][0] && b[2][0] != '.')
65     {
66         drawFBoard(b);
67         cout << "Winner is : " << b[1][0] << endl;
68         return true;
69     }
70     else if (b[0][1] == b[1][1] && b[1][1] == b[2][1] && b[2][1] != '.')
71     {
72         drawFBoard(b);
73         cout << "Winner is : " << b[1][1] << endl;
74         return true;
75     }
76     else if (b[0][2] == b[1][2] && b[1][2] == b[2][2] && b[2][2] != '.')
77     {
78         drawFBoard(b);
79         cout << "Winner is : " << b[1][2] << endl;
```

```

80     ....return true;
81     ....}
82     ....// diagonal win
83     ....else if (b[0][0] == b[1][1] && b[1][1] == b[2][2] && b[2][2] != '.')
84     ....{
85     ....    drawFBoard(b);
86     ....    cout << "Winner is : " << b[1][1] << endl;
87     ....    return true;
88     ....}
89     ....else if (b[0][2] == b[1][1] && b[1][1] == b[2][0] && b[2][0] != '.')
90     ....{
91     ....    drawFBoard(b);
92     ....    cout << "Winner is : " << b[2][2] << endl;
93     ....    return true;
94     ....}
95     ....else
96     ....    return false;
97 }
98
99 int main()
100 {
101
102     ....char board[3][3] = {
103     ....    {'.', '.', '.'},
104     ....    {'.', '.', '.'},
105     ....    {'.', '.', '.'}};
106     ....bool boardAvailable[3][3] = {
107     ....    {true, true, true},
108     ....    {true, true, true},
109     ....    {true, true, true}};
110     ....char CPlayer, player1 = 'X', player2 = 'O';
111     ....bool GameOver = false;
112     ....CPlayer = player1;
113     ....int row, col;
114
115     ....while (!GameOver)
116     ....{
117     ....    getinput:
118     ....    ....system("cls");
119     ....    drawBoard(board, CPlayer);
120     ....    cin >> row >> col;
121     ....    if (boardAvailable[row][col])
122     ....    {
123     ....        ....if (row < 3 && col < 3 && row > -1 && col > -1)
124     ....        ....{
125     ....            ....board[row][col] = CPlayer;
126     ....            ....boardAvailable[row][col] = false;
127     ....        ....}
128     ....        ....else
129     ....        ....{
130     ....            ....cout << "Row and Column is wrong.ReEnter : (Press Enter to continue)";
131     ....            ....cin.ignore();
132     ....            ....cin.ignore();
133     ....            ....goto getinput;
134     ....        ....}
135     ....    }
136     ....    else
137     ....    {
138     ....        ....cout << "Place Occupied ReEnter : (Press Enter to continue)";
139     ....        ....cin.ignore();
140     ....        ....cin.ignore();
141     ....        ....goto getinput;
142     ....    }
143     ....    if (CPlayer == player1)
144     ....        CPlayer = player2;
145     ....    else
146     ....        CPlayer = player1;
147
148     ....    if (checkWinner(board))
149     ....        GameOver = true;
150     ....}
151
152     ....return 0;
153 }

```

Output:

```

      column 0      column 1      column 2
row 0              |          0          |
-----
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
-----
row 2              |          0          |          0

Winner is : X
```