



INSTITUTE OF INFORMATION TECHNOLOGY
JAHANGIRNAGAR UNIVERSITY

Lab Exam : 02
Submission Date : 24/01/2022
Course Title : Algorithm Analysis and Design Lab
Course Code : ICT - 2202

Submitted To

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Submitted By

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Roll – 2023
2nd year 2st Semester
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Answer to the problem no - 1

```
Problem 1.cpp - Code::Blocks 17.12
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Start here x Problem 1.cpp x *problem 2.cpp x

1 // Md. Shakil Hossain
2 // Roll - 2023
3 // Lab Test 2
4
5 #include <bits/stdc++.h>
6 using namespace std;
7
8 void gP(int n, int o, int c, string s, vector<string> &ans) {
9
10     if(o==n && c==n) {
11         ans.push_back(s);
12         return;
13     }
14     if(o<n) {
15         gP(n, o+1, c, s+"(", ans);
16     }
17     if(c<o) {
18         gP(n, o, c+1, s+")", ans);
19     }
20
21 }
22
23
```

```
Problem 1.cpp - Code::Blocks 17.12
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Start here x Problem 1.cpp x *problem 2.cpp x

20
21 }
22
23
24
25 int main() {
26     int n;
27     cout<<"N = ";
28     cin>>n;
29     vector<string> ans;
30     gP(n, 0, 0, "", ans);
31     cout<<"\nOutput : "<<endl;
32     for(auto s:ans) {
33         cout<<s<<endl;
34     }
35     return 0;
36 }
37
```

```
"D:\Github\Algorithm-Analysis-and-Design-Lab\Exam\Exam 2\Code\Problem 1.ex...
N = 3

Output :
((( )))
(( ( ))
(( )) (
(( ( ))
(( ( ))
(( ( ))

Process returned 0 (0x0)    execution time : 4.592 s
Press any key to continue.
```

Answer to the problem no – 2

problem 2.cpp - Code::Blocks 17.12

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```
1 // Md. Shakil Hossain
2 // Roll - 2023
3 // Lab Test 2
4
5 #include <bits/stdc++.h>
6 using namespace std;
7 #define N 4
8
9 bool solve(int maze[N][N], int x, int y, int sol[N][N]);
10
11 void pS(int sol[N][N])
12 {
13     for (int i = 0; i < N; i++)
14     {
15         for (int j = 0; j < N; j++)
16             cout << " " << sol[i][j];
17         cout << endl;
18     }
19 }
20
```

```
23
24 bool isSafe(int maze[N][N], int x, int y)
25 {
26     if (x >= 0 && x < N && y >= 0 && y < N && maze[x][y] == 1)
27         return true;
28
29     return false;
30 }
31 bool solveMaze(int maze[N][N])
32 {
33     int sol[N][N] = {
34         { 0, 0, 0, 0 },
35         { 0, 0, 0, 0 },
36         { 0, 0, 0, 0 },
37         { 0, 0, 0, 0 }
38     };
39
40     if (solve(maze, 0, 0, sol) == false)
41     {
42         cout << "Solution doesn't exist";
43         return false;
44     }
45     pS(sol);
46     return true;
47 }
```

```
49
50 bool solve(
51     int maze[N][N], int x,
52     int y, int sol[N][N])
53 {
54     if (x == N - 1 && y == N - 1 && maze[x][y] == 1)
55     {
56         sol[x][y] = 1;
57         return true;
58     }
59
60     if (isSafe(maze, x, y) == true)
61     {
62         if (sol[x][y] == 1)
63             return false;
64         sol[x][y] = 1;
65         if (solve(maze, x + 1, y, sol) == true)
66             return true;
67         if (solve(maze, x, y + 1, sol) == true)
68             return true;
69         sol[x][y] = 0;
70         return false;
71     }
72     return false;
73 }
74
```

```
problem 2.cpp - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help

Start here × Problem 1.cpp × problem 2.cpp ×

71     }
72     return false;
73 }
74
75
76
77
78 int main()
79 {
80     int maze[N][N] = { { 1, 0, 0, 0 },
81                        { 1, 1, 0, 1 },
82                        { 0, 1, 0, 0 },
83                        { 1, 1, 1, 1 }
84     };
85     solveMaze(maze);
86     return 0;
87 }
88
```

```
"D:\Github\Algorithm-Analysis-and-Design-Lab\Exam\Exam 2\Code\problem 2.ex...
1 0 0 0
1 1 0 0
0 1 0 0
0 1 1 1

Process returned 0 (0x0)   execution time : 0.155 s
Press any key to continue.
```

THE END