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TDM-GCC 4.9.2 64-bit Release

(globals)

Johnson\_trotter\_prog.cpp

```
1 #include <bits/stdc++.h>
2
3 using namespace std;
4 bool LEFT_TO_RIGHT = true;
5 bool RIGHT_TO_LEFT = false;
6
7
8 int searchArr(int a[], int n, int mobile)
9 {
10     for (int i = 0; i < n; i++)
11         if (a[i] == mobile)
12             return i + 1;
13 }
14
15
16 int getMobile(int a[], bool dir[], int n)
17 {
18     int mobile_prev = 0, mobile = 0;
19     for (int i = 0; i < n; i++)
20     {
21
22         if (dir[a[i]-1] == RIGHT_TO_LEFT && i!=0)
23         {
24             if (a[i] > a[i-1] && a[i] > mobile_prev)
25             {
26                 mobile = a[i];
27                 mobile_prev = mobile;
28             }
29         }
30         if (dir[a[i]-1] == LEFT_TO_RIGHT && i!=n-1)
31         {
32             if (a[i] > a[i+1] && a[i] > mobile_prev)
33             {
34                 mobile = a[i];
35                 mobile_prev = mobile;
36             }
37         }
38     }
39     if (mobile == 0 && mobile_prev == 0)
40         return 0;
41     else
42         return mobile;
43 }
44
45
46 int printOnePerm(int a[], bool dir[], int n)
47 {
48     int mobile = getMobile(a, dir, n);
```

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(globals)

Johnson\_trotter\_prog.cpp

```
46 int printOnePerm(int a[], bool dir[], int n)
47 {
48     int mobile = getMobile(a, dir, n);
49     int pos = searchArr(a, n, mobile);
50     if (dir[a[pos] - 1] == RIGHT_TO_LEFT)
51         swap(a[pos-1], a[pos-2]);
52
53     else if (dir[a[pos] - 1] == LEFT_TO_RIGHT)
54         swap(a[pos], a[pos-1]);
55     for (int i = 0; i < n; i++)
56     {
57         if (a[i] > mobile)
58         {
59             if (dir[a[i] - 1] == LEFT_TO_RIGHT)
60                 dir[a[i] - 1] = RIGHT_TO_LEFT;
61             else if (dir[a[i] - 1] == RIGHT_TO_LEFT)
62                 dir[a[i] - 1] = LEFT_TO_RIGHT;
63         }
64         for (int i = 0; i < n; i++)
65             cout << a[i];
66         cout << " ";
67     }
68
69
70
71 int fact(int n)
72 {
73     int res = 1;
74     for (int i = 1; i <= n; i++)
75         res = res * i;
76     return res;
77 }
78
79
80 void printPermutation(int n)
81 {
82     int a[n];
83     bool dir[n];
84     for (int i = 0; i < n; i++)
85     {
86         a[i] = i + 1;
87         cout << a[i];
88         cout << " ";
89     }
90     cout << endl;
91
92     for (int i = 0; i < n; i++)
93         dir[i] = RIGHT_TO_LEFT;
```

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(globals)

Johnson\_trotter\_prog.cpp

```
59 if (dir[a[i] - 1] == LEFT_TO_RIGHT)
60 dir[a[i] - 1] = RIGHT_TO_LEFT;
61 else if (dir[a[i] - 1] == RIGHT_TO_LEFT)
62 dir[a[i] - 1] = LEFT_TO_RIGHT;
63 }
64 }
65 for (int i = 0; i < n; i++)
66 cout << a[i];
67 cout << " ";
68 }
69
70
71 int fact(int n)
72 {
73     int res = 1;
74     for (int i = 1; i <= n; i++)
75         res = res * i;
76     return res;
77 }
78
79
80 void printPermutation(int n)
81 {
82     int a[n];
83     bool dir[n];
84     for (int i = 0; i < n; i++)
85     {
86         a[i] = i + 1;
87         cout << a[i];
88         cout << " ";
89     }
90     cout << endl;
91     for (int i = 0; i < n; i++)
92         dir[i] = RIGHT_TO_LEFT;
93     for (int i = 1; i < fact(n); i++)
94         printOnePerm(a, dir, n);
95 }
96
97
98
99 int main()
100 {
101     int n = 4;
102     printPermutation(n);
103     return 0;
104 }
105
```

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