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Question5.cpp

```
//<----Lab 01 - Arrays and Dynamic Memory Allocation---->
 2
    // Q5. Write a program that creates a 2D array of 5x5 values of type boolean. Suppose indices
 3
 4
           represent cities and that the value at row i, column j of a 2D array is true just in
    case i and
 5
           j are direct neighbors and false otherwise. Use initializer list to instantiate and
    initialize
 6
           your array to represent the following configuration: (* means "neighbors")
 7
 8
    //
           Write a method to check whether two cities have a common neighbor. For example, in the
 9
           example above, 0 and 2, 3 and 4 are neighbors with 1 (so they have a common neighbor),
    //
10
    //
           whereas 0 and 1 have no common neighbors.
11
    #include<iostream>
12
13
    using namespace std;
14
15
    class array2d{
        const bool city[5][5]={{false,true,false,false,false},{true,false,true,false,false}
16
    {false,true,false,false,true},{false,true,true,false,false},{false,true,true,true,false}};
17
        int row;
18
        int col;
        bool** arr;
19
20
        public:
            array2d(int r=5,int c=5):row(r),col(c){
21
22
                 arr = new bool*[5];
23
                 for(int i=0;i<5;i++){
24
                     arr[i]=new bool[5];
25
26
                 for(int i=0;i<5;i++){</pre>
27
                     for(int j=0;j<5;j++){</pre>
28
                         arr[i][j]=city[i][j];
29
                     }
30
                 }
31
32
33
            void display(){
34
                 cout<<endl;
35
                 for(int i=0;i<row;i++){</pre>
                     cout<<"\t";
36
37
                     for(int j=0; j<col; j++){
38
                         cout<<arr[i][j]<<"\t";</pre>
39
                     }
40
                     cout<<endl;
41
42
                 cout<<endl;
43
44
            void searchneighbours(int city1,int city2){
45
                 for(int i=0;i<5;i++){</pre>
46
                     if(arr[city1][i]==arr[city2][i] && arr[city1][i]== true && arr[city2][i]==
    true){
                     cout<<"City "<<city1<<" and city "<<city2<<" share neighbour at index "<<i<<"
47
      "<<endl;
                     }
48
49
```

```
50
              }
 51
     };
 52
 53
     int main(){
 54
         int c1,c2;
 55
         array2d cities;
 56
         cities.display();
 57
         cout<<"Enter cities to check"<<endl;</pre>
 58
         cin>>c1>>c2;
 59
         cities.searchneighbours(c1,c2);
 60
 61
 62
     //First Attempt
 63
 64
     //#include<iostream>
 65
     //using namespace std;
     //class Array{
 66
        int row;
 67
     //
         int column;
 68
         bool arr[5][5];
 69
     //
 70
    //
         public:
 71
    //
         Array(int r=5,int c=5):row(r),column(c){
 72
    //
             for(int i=0;i<r;i++){
 73
    //
                  for(int j=0;j<c;j++){
 74
    //
                      arr[i][j]=false;
 75
    //
                  }
 76
    //
              }
 77
     //
              arr[0][1]=true;
 78
    //
             arr[1][0]=true;
 79
    //
              arr[1][2]=true;
 80
    //
             arr[2][1]=true;
 81
    //
             arr[2][4]=true;
 82
    //
             arr[3][1]=true;
 83
    //
              arr[3][2]=true;
 84
    //
              arr[4][1]=true;
 85
    //
              arr[4][2]=true;
 86
     //
              arr[4][3]=true;
 87
     //
         }
     //
 88
         void display(){
             for(int i=0;i<5;i++){
 89
    //
     //
 90
                  for(int j=0;j<5;j++){
 91
    //
                      cout<<arr[i][j]<<" ";</pre>
 92
    //
 93
     //
                  cout<<endl;
 94
     //
              }
 95
     //
 96
    //
         void search(int city1,int city2){
 97
     //
              for(int i=0;i<5;i++){
 98
                  if(arr[city1][i]==arr[city2][i] && arr[city2][i]==true && arr[city1][i]==true ){
    //
 99
     //
                      cout<<"Common Neighbour of City1 and City2 are index "<<i<<endl;</pre>
100
    //
                  }
101
     //
              }
102
     // }
     //};
103
104
     //
105
    //int main(){
```

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```
106  // Array cities;
107  // cities.search(0,2);
108  // cities.search(1,4);
109  // cities.display();
110  //}
```