

```

# Program to count islands in boolean 2D matrix
class Graph:
    def __init__(self, row, col, g):
        self.ROW = row
        self.COL = col
        self.graph = g

# A function to check if a given cell (row, col) can be included in DFS
def isSafe(self, i, j, visited):
    # row number is in range, column number is in range and value is 1 and not yet visited
    return (i >= 0 and i < self.ROW and
            j >= 0 and j < self.COL and
            not visited[i][j] and self.graph[i][j])

# A utility function to do DFS for a 2D boolean matrix. It only considers the 8 neighbours as adjacent vertices
def DFS(self, i, j, visited):
    # These arrays are used to get row and column numbers of 8 neighbours of a given cell
    rowNbr = [-1, -1, -1, 0, 0, 1, 1, 1];
    colNbr = [-1, 0, 1, -1, 1, -1, 0, 1];

    # Mark this cell as visited
    visited[i][j] = True

    # Recur for all connected neighbours
    for k in range(8):
        if self.isSafe(i + rowNbr[k], j + colNbr[k], visited):
            self.DFS(i + rowNbr[k], j + colNbr[k], visited)

```

The main function that returns count of islands in a given boolean 2D matrix

```
def countIslands(self):  
    # Make a bool array to mark visited cells.  
    # Initially all cells are unvisited  
    visited = [[False for j in range(self.COL)] for i in range(self.ROW)]  
    # Initialize count as 0 and traverse through the all cells of given matrix  
    count = 0  
    for i in range(self.ROW):  
        for j in range(self.COL):  
            # If a cell with value 1 is not visited yet, then new island found  
            if visited[i][j] == False and self.graph[i][j] == 1:  
                # Visit all cells in this island and increment island count  
                self.DFS(i, j, visited)  
                count += 1  
    return count
```

```
graph = [[1, 1, 0, 0, 0],  
         [0, 1, 0, 0, 1],  
         [1, 0, 0, 1, 1],  
         [0, 0, 0, 0, 0],  
         [1, 0, 1, 0, 1]]
```

```
row = len(graph)  
col = len(graph[0])
```

```
g = Graph(row, col, graph)
```

```
print "Number of islands is:"  
print g.countIslands()
```