a program to implement depth limited search.

In [1]:
```
ADJ = {}
"""
SRRXG
RXRXR
RRRXR
XRXRR
RRRRX
"""
ADJ['S'] = ['2', '6']
ADJ['2'] = ['S', '3']
ADJ['3'] = ['2','8']
ADJ['G'] = ['10']
ADJ['6'] = ['S', '11']
ADJ['8'] = ['3', '13']
ADJ['10'] = ['G', '15']
ADJ['11'] = ['6', '12']
ADJ['12'] = ['11', '13', '17']
ADJ['13'] = ['8', '12']
ADJ['15'] = ['10', '20']
ADJ['17'] = ['12','22']
ADJ['19'] = ['20', '24']
ADJ['20'] = ['15','19']
ADJ['21'] = ['22']
ADJ['22'] = ['17','21','23']
ADJ['23'] = ['22', '24']
ADJ['24'] = ['19','23']
print ("adj",ADJ)
# keep track of visited nodes
visited = {str(i) : False for i in range(1,26)}
visited['S'] = False
visited['G'] = False

def dls(start, goal,limit):
    depth = 0

    OPEN=[]
    CLOSED=[]
    OPEN.append(start)
    visited["S"] = True
    while OPEN != []: # Step 2
        if depth<=limit:
            current = OPEN.pop()

            if current == goal:
                print("Goal Node Found")
                return True
            else:
                lst = successors(current)
                for i in lst:
                    # try to visit a node in future, if not already been to it
                    if(not(visited[i])):
                        OPEN.append(i)

                        visited[i] = True
                depth +=1
```

```
        else:
            print("Not found within depth limit")
            return False
        print(OPEN)
        #print("node visited",i,sep='>',end='\n')
    return False

def successors(city):
    return ADJ[city]

def test():
    start = 'S'
    goal = 'G'
    limit=int(input("ENTER THE DEPTH LIMIT"))
    print("Starting a dls from \n[ " + start+" ]")
    print(dls(start, goal,limit))


if __name__ == "__main__":
    test()
```

```
adj {'S': ['2', '6'], '2': ['S', '3'], '3': ['2', '8'], 'G': ['10'], '6':
['S', '11'], '8': ['3', '13'], '10': ['G', '15'], '11': ['6', '12'], '12':
['11', '13', '17'], '13': ['8', '12'], '15': ['10', '20'], '17': ['12', '2
2'], '19': ['20', '24'], '20': ['15', '19'], '21': ['22'], '22': ['17', '21',
'23'], '23': ['22', '24'], '24': ['19', '23']}
ENTER THE DEPTH LIMIT200
Starting a dls from
[ S ]
['2', '6']
['2', '11']
['2', '12']
['2', '13', '17']
['2', '13', '22']
['2', '13', '21', '23']
['2', '13', '21', '24']
['2', '13', '21', '19']
['2', '13', '21', '20']
['2', '13', '21', '15']
['2', '13', '21', '10']
['2', '13', '21', 'G']
Goal Node Found
True
```

In [ ]: