In [2]:

```
'''SuccList={'a':['b','c'],'b':['a','c','d'],'c':['a','b','d'],'d':['b','c']}'''
SuccList ={ 'A':['B','C'], 'B':['D','E','F'], 'C':['G','H','I'], 'D':[],'E':[],'F':['J
'I':['L','M'], 'J':[], 'K':[], 'L':[], 'M':[] }
Start='A'
Goal='L'
Closed = list()
SUCCESS=True
FAILURE=False
State=FAILURE

def GOALTEST(N):
    if N == Goal:
        return True
    else:
        return False

def MOVEGEN(N):
    New_list=list()
    if N in SuccList.keys():
        New_list=SuccList[N]
        print("New_list=",New_list)
        return New_list

def APPEND(L1,L2):
    New_list=L1+L2
    return New_list

def DFS():
    OPEN=[Start]
    CLOSED=list()
    global State
    global Closed
    while (len(OPEN) != 0) and (State != SUCCESS):
        print("------------")
        N= OPEN[0]
        print("N=",N)
        del OPEN[0] #delete the node we picked
        if GOALTEST(N)==True:
            State = SUCCESS
            CLOSED = APPEND(CLOSED,list(N))
            print("CLOSED=",CLOSED)
        else:
            CLOSED = APPEND(CLOSED,list(N))
            print("CLOSED=",CLOSED)
            CHILD = MOVEGEN(N)
            print("CHILD=",CHILD)
            for val in CLOSED:
                if val in CHILD:
                    CHILD.remove(val)

            for val in OPEN:
                if val in CHILD:
                    CHILD.remove(val)

            OPEN = APPEND(CHILD,OPEN) #append movegen elements to OPEN
            print("OPEN=",OPEN)

    Closed=CLOSED
```

```
    return State
#Driver Code
result=DFS() #call search algorithm
print(Closed,result)
```

```
------------
N= A
CLOSED= ['A']
New_list= ['B', 'C']
CHILD= ['B', 'C']
OPEN= ['B', 'C']
------------
N= B
CLOSED= ['A', 'B']
New_list= ['D', 'E', 'F']
CHILD= ['D', 'E', 'F']
OPEN= ['D', 'E', 'F', 'C']
------------
N= D
CLOSED= ['A', 'B', 'D']
New_list= []
CHILD= []
OPEN= ['E', 'F', 'C']
------------
N= E
CLOSED= ['A', 'B', 'D', 'E']
New_list= []
CHILD= []
OPEN= ['F', 'C']
------------
N= F
CLOSED= ['A', 'B', 'D', 'E', 'F']
New_list= ['J', 'K']
CHILD= ['J', 'K']
OPEN= ['J', 'K', 'C']
------------
N= J
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J']
New_list= []
CHILD= []
OPEN= ['K', 'C']
------------
N= K
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J', 'K']
New_list= []
CHILD= []
OPEN= ['C']
------------
N= C
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J', 'K', 'C']
New_list= ['G', 'H', 'I']
CHILD= ['G', 'H', 'I']
OPEN= ['G', 'H', 'I']
------------
N= G
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J', 'K', 'C', 'G']
New_list= []
CHILD= []
OPEN= ['H', 'I']
------------
N= H
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J', 'K', 'C', 'G', 'H']
New_list= []
CHILD= []
OPEN= ['I']
```

```
------------
N= I
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J', 'K', 'C', 'G', 'H', 'I']
New_list= ['L', 'M']
CHILD= ['L', 'M']
OPEN= ['L', 'M']
------------
N= L
CLOSED= ['A', 'B', 'D', 'E', 'F', 'J', 'K', 'C', 'G', 'H', 'I', 'L']
['A', 'B', 'D', 'E', 'F', 'J', 'K', 'C', 'G', 'H', 'I', 'L'] True
```

In [ ]: