1-E(3.4.24).py - C:/231501167/1-E(3.4.24).py (3.12.2)

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```
from collections import deque
class Graph:
    def __init__(self,adjac_lis):
        self.adjac_lis=adjac_lis
    def get_neighbors(self,v):
        return self.adjac_lis[v]
    def h(self,n):
        H={'A':1,'B':1,'C':1,'D':1}
        return H[n]
    def a_star_algorithm(self,start,stop):
        open_lst=set([start])
        closed_lst=set([])
        poo={}
        poo[start]=0
        par={}
        par[start]=start
        while len(open_lst)>0:
            n=None
            for v in open_lst:
                if n==None or poo[v]+self.h(v)<poo[n]+self.h(n):
                    n=v;
            if n==None:
                print('Path does not exist')
                return None
            if n==stop:
                reconst_path=[]
```

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```
                reconst_path=[]
                while par[n]!=n:
                    reconst_path.append(n)
                    n=par[n]
                reconst_path.append(start)
                reconst_path.reverse()
                print('Path found:{}'.format(reconst_path))
                return reconst_path
            for (m,weight)in self.get_neighbors(n):
                if m not in open_lst and m not in closed_lst:
                    open_lst.add(m)
                    par[m]=n
                    poo[m]=poo[n]+weight
                else:
                    if poo[m]>poo[n]+weight:
                        poo[m]=poo[n]+weight
                        par[m]=n
                        if m in closed_lst:
                            closed_lst.remove(m)
                            open_lst(m)
            open_lst.remove(n)
            closed_lst.add(n)
        print('Path does not exist!')
        return None
adjac_lis={'A':[('B',1),('C',3),('D',7)],'B':[('D',5)],'C':[('D',12)]}
graph1=Graph(adjac_lis)
```

IDLE Shell 3.12.2

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```
Python 3.12.2 (tags/v3.12.2:6abddd9, Feb  6 2024, 21:26:36) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/231501167/1-E(3.4.24).py
Path found:['A', 'B', 'D']
>>>
```