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A* Algorithm

Code:

```python
def AstarAlgo(start,goal):
    open=set(start)
    closed=set()
    g={}
    parent={}
    g[start]=0
    parent[start]=start
    while len(open)>0:
        n=None
        for v in open:
            if n==None or g[v]+h(v)<g[n]+h(n):
                n=v
        if n==goal or graph[n]==None:
            pass
        else:
            for(m,weight) in get_neighbours(n):
                if m not in open and m not in closed:
                    open.add(m)
                    parent[m]=n
                    g[m]=g[n]+weight
                else:
                    if g[m]>g[n]+weight :
                        g[m]=g[n]+weight
                        parent[m]=n
                        if m in closed:
                            closed.remove(m)
                            open.add(m)
```

```python
                                closed.remove(m)
                                open.add(m)


            if n==None:
                print('path doesnt exist!')
                return None
            if n==goal:
                path=[]
                while parent[n]!=n:
                    path.append(n)
                    n=parent[n]
                path.append(start)
                path.reverse()
                print('Path is as follows:',format(path))
                return path
            open.remove(n)
            closed.add(n)
        print('path doesnt exists!')
        return None
def get_neighbours(v):
    if v in graph:
        return graph[v]
    else:
        return None
def h(n):
    H_dist={
        'A':11,
        'B':6,
```

```python
        return None
def h(n):
    H_dist={
        'A':11,
        'B':6,
        'C':5,
        'D':7,
        'E':3,
        'F':6,
        'G':5,
        'H':3,
        'I':1,
        'J':0
    }
    return H_dist[n]
graph={
    'A':[('B',6),('F',3)],
    'B':[('A',6),('C',3),('D',2)],
    'C':[('B',3),('D',1),('E',5)],
    'D':[('B',2),('C',1),('E',8)],
    'E':[('C',5),('D',8),('I',5),('J',5)],
    'F':[('A',3),('G',1),('H',7)],
    'G':[('F',1),('I',3)],
    'H':[('F',7),('I',2)],
    'I':[('E',5),('G',3),('H',2),('J',3)]
}
AstarAlgo('A','J')
```

Output:

```
[9]
...    Path is as follows: ['A', 'F', 'G', 'I', 'J']

       ['A', 'F', 'G', 'I', 'J']
```