9/11/20 ARTIFICIAL INTELLIGENCE LAB 1 TANYA MISHRA 1BM18CS117

① IDS Algorithm

```
import numpy as np
from PuzzleNode import *
import copy
import time
from queue import PriorityQueue
from itertools import count
```

~~priorityQueue.put((startNode.manhattanDist(), next(ubiques), [startNode, 0]))~~

```
def IDS(startNode):
    maxlayer = 1
    while True:
        dfsList = []
        layer = 0
        dfsList.append((startNode, layer))
        while len(dfsList) != 0:
            top = dfsList.pop()
            tempNode = top[0]
            templayer = top[1]
            if tempNode.isGoal():
                trace = []
                ptr = tempNode
```

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```
while ptr is not None:
    trace.append(ptr.node)
    ptr = ptr.parent
    return templayer, trace

nextlayer = templayer + 1
if nextlayer > maxlayer:
    continue

validmoves = tempNode.getValidMoves:

    for move Char in validMoves:
        nextNode =
            copy.deepcopy(tempNode)
                nextNode.doMove(move.char)
        if Not
in DFS NodeList(nextNode, dfsList):
    dfslist.append((nextNode,
                    nextlayer))

NextNode.parent = tempNode
    maxlayer = Maxlayer + 1
```

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```
def inDFSNodelist(tNode, nlist):
    for node in nlist:
        if (node[0].node ==
            tNode.node).all():
                return True

    return False

test = PuzzleNode()

test
step, trace = IDS(test)
print(step)
while len(trace) != 0
    n = trace.pop()
    print(n)
```