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Assignment 4
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1. Implement a greedy algorithm to approximately solve the TSP.

2. Dijkstra's algorithm is an example of a greedy algorithm. Give pseudocode for a modified version of Dijkstra's algorithm that returns `true` if the graph contains a cycle.

```
parent = empty map v → v
distance = empty map v → int
visited = empty set
cycleExists = false

while (not all vertices have been visited):
      current = cheapest unvisited vertex from distance table
      visited.add(current) & check if target
      for all other children in adjacent nodes of current:
            if child is in visited:
                  cycleExists = true
            else:
                  edgeCost = edge weight between current and other
                  cost = distance(current)
                  if (edgeCost + cost < distance(other)):
                        update distance for other
                        parent.push(other, current)
return cycleExists
```

3. Optimal File Storage

Minimum expected access time can be guaranteed by arranging the files from smallest to largest based on their value derived from (size of file / probability file will need to be accessed). For example, if a file has a size of 2 and the probability it will need to be accessed is 1 and another file has a size of 3 and the probability it will need to be accessed is 3, the second file will appear first on the tape.

4. Weiss Exercise 10.3: A file contains only colons, spaces, newlines, commas, and digits in the following frequency: colon (100), space (605), newline (100), comma (705), 0 (431), 1 (242), 2 (176), 3 (59), 4 (185), 5 (250), 6 (174), 7 (199), 8 (205), 9 (217). Construct the Huffman Code.

Character	Huffman Code
:	001001

space	**000**
newline	**00101**
,	**11**
0	**101**
1	**1000**
2	**00111**
3	**001000**
4	**0100**
5	**1001**
6	**00110**
7	**0101**
8	**0110**
9	**0111**