Unit 3 Algorithmics

Submit Task – Week 5

Debugging

Find the errors in the pseudocode below.

Depth first search:

```
DFS(node):
    mark node as visited
    print node
    for each neighbour in neighbours of node:
        if neighbour is not visited:
            mark neighbour as visited
```

Only searches one level due to the lack of a stack and nested iteration/recursion to search further down adjecent nodes

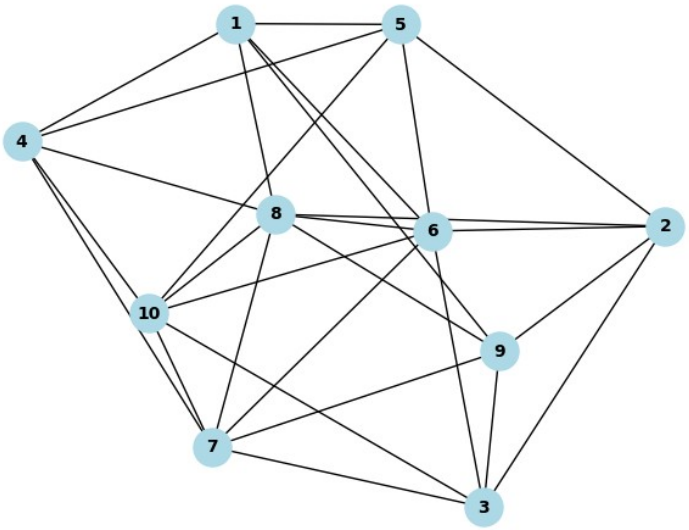
Breadth first search:

```
BFS(graph, start):
    create an empty queue Q
    enqueue start into Q
    mark start as visited

    while True:
        node = dequeue Q
        print node
        for each neighbour in neighbours of node:
            if neighbour is not visited:
                mark neighbour as visited
                enqueue neighbour into Q
```

Lack of base case, will infinately loop until “Q” is empty then error out

Rumour Spreading



This graph models 10 people as nodes, with their friendship connections as edges.

1. Assuming that nodes are chosen in numerical order as a tie-breaker, write down the order in which BFS and DFS would each choose nodes, starting with #1.
   [1, 4, 5, 8, 7, 10, 2, 6, 9, 3] BFS
   [1, 4, 7, 3, 2, 5, 10, 6, 8, 9] DFS
2. If a person spreads a rumour to all of their friends on a given day, which search pattern is more appropriate?
   BFS as it would emulate the growth of a roumor spread.
3. Write your own BFS code, using the template provided. (The DFS code is included, so you can get an idea of how it might be changed).
   https://trinket.io/python3/d0a8e9b22b