Graphs

3D5

Name: Oisín Cullen |Student number: 20332292 | Date: 29/11/2022

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Task 1

In task one we were asked to create a graph search through it via depth first search and Breadth first search and delete it without causing memory leaks.

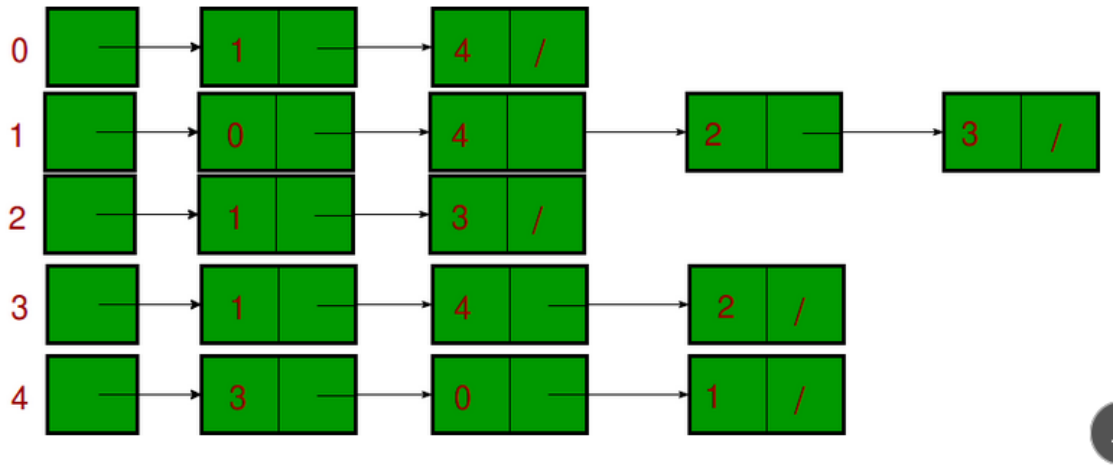

Figure 1 Source:https://www.geeksforgeeks.org/graph-and-its-representations/

To create a graph we were asked to use linked lists. I essentially created a 2d linked list. One was a column which was an array which stored every vertex and across each row was that vertices edges.

The add edge function created space for a node and had a pointer which led to the next edge in the list.

Breadth first search. Is a search function which prioritizes searching the adjacent edges of one node before going searching through that edge's adjacent edges. To implement a BFS algorithm a queue. A Queue works by using a FIFO method which pushes things in through the tail and out through the head.

```
DFS: A B C D F E

BFS: A B D E C F
[1] + Done                       "/usr/bin/gdb
```

Depth First Search uses a recursive approach to search through the graph. It first checks the first edge of a node and marks it as visited it then checks that edge of a node and marks it as visited; this is repeated throughout the function until all vertices are visited.

Delete graph then cycles through the Graph and deletes all the nodes without causing a memory leak.

Task 2:

I Decided not to do task 2 because I didn't have the time.

Credits:

https://www.geeksforgeeks.org/graph-and-its-representations/

I found very useful for explaining how to implement a graph and how to initialize it.