

CSC263: DFS

Question 1

We argued that the runtime of DFS is $O(|V| + |E|)$ when using an adjacency list representation of a graph. What is the runtime of DFS when using an adjacency matrix?

Question 2

Consider the following code that might be DFS.

```
MAYBE_DFS(G, u):
  S <- Stack()
  visited <- []
  Push(S, u)
  visited.append(u)
  while S not empty:
    x <- Pop(S)
    print x
    for each neighbour n of x:
      if n not in visited:
        Push(S, n)
        visited.append(n)
        pi[n] = x
```

What is the runtime, assuming an adjacency list representation?

Can you find a graph on which this traversal produces π values that could never be produced by DFS from lecture?