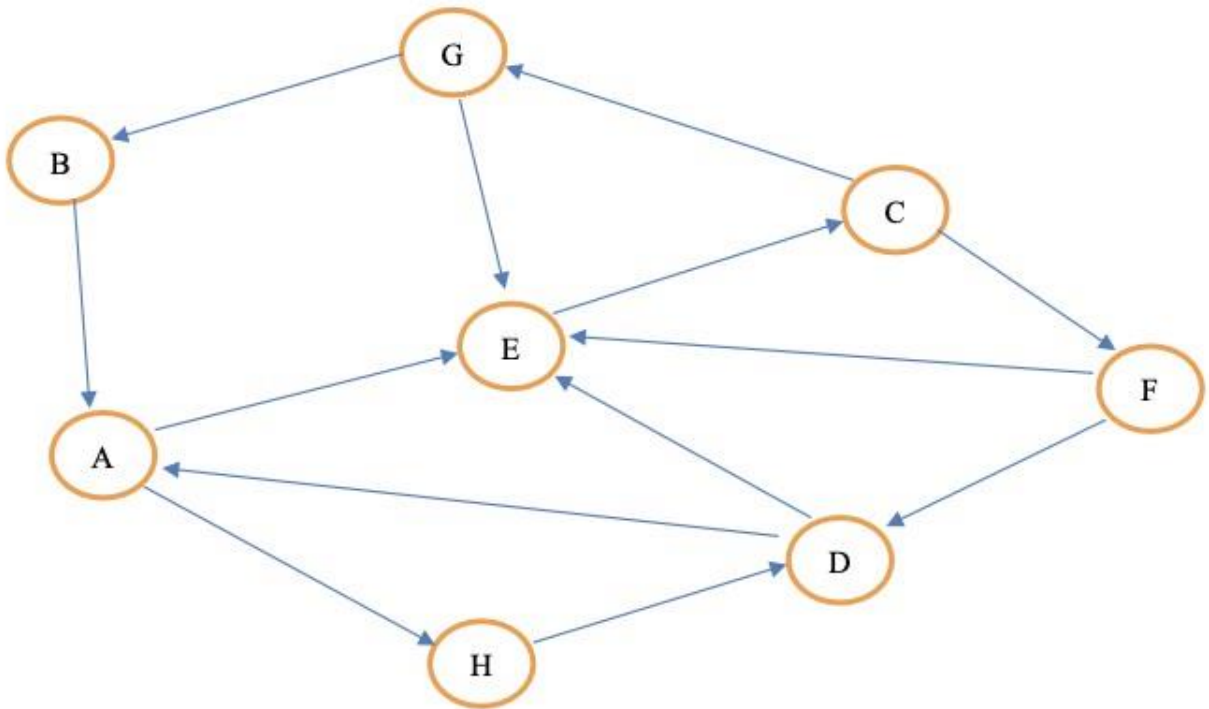


# CSC6013 - Worksheet for Week 4

DFS - Breadth First Search using the brute force algorithm as seen in class

Consider the graph below:



1) Represent this graph using an adjacency list. Arrange the neighbors of each vertex in alphabetical order.

- list the triplets for this graph in the form  $(A, B, 1)$ , where there is a edge from vertex A to vertex B;
- Note that this graph is directed, unlike the one presented in class.
- $(A, E, 1)$ ,  $(A, H, 1)$
- $(B, A, 1)$
- $(C, F, 1)$ ,  $(C, G, 1)$
- $(D, A, 1)$ ,  $(D, E, 1)$
- $(E, C, 1)$
- $(F, D, 1)$ ,  $(F, E, 1)$
- $(G, B, 1)$ ,  $(G, E, 1)$
- $(H, D, 1)$

2) Trace the DFS execution by adapting the code to deal with a directed graph (remove lines 7 and 8) and instrumenting it to print every time a recursive call is made and a vertex is visited:

- Each time a recursive call is made for vertex A, print: DFS called for vertex A;
- Each time a vertex A is visited print: Vertex A visited and received the stamp “<count>” and the current array V.

```
DFS called for vertex A
Vertex A is visited and received the stamp 0 | Visited: ['A', -1, -1, -1, -1, -1, -1, -1]
DFS called for vertex E
Vertex E is visited and received the stamp 1 | Visited: ['A', -1, -1, -1, 'E', -1, -1, -1]
DFS called for vertex C
Vertex C is visited and received the stamp 2 | Visited: ['A', -1, 'C', -1, 'E', -1, -1, -1]
DFS called for vertex F
Vertex F is visited and received the stamp 3 | Visited: ['A', -1, 'C', -1, 'E', 'F', -1, -1]
DFS called for vertex D
Vertex D is visited and received the stamp 4 | Visited: ['A', -1, 'C', 'D', 'E', 'F', -1, -1]
DFS called for vertex G
Vertex G is visited and received the stamp 5 | Visited: ['A', -1, 'C', 'D', 'E', 'F', 'G', -1]
DFS called for vertex B
Vertex B is visited and received the stamp 6 | Visited: ['A', 'B', 'C', 'D', 'E', 'F', 'G', -1]
DFS called for vertex H
Vertex H is visited and received the stamp 7 | Visited: ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H']
```