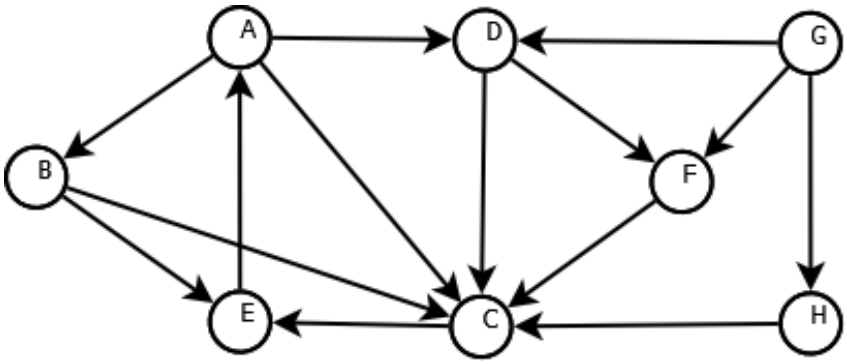
Design and Analysis of Algorithms

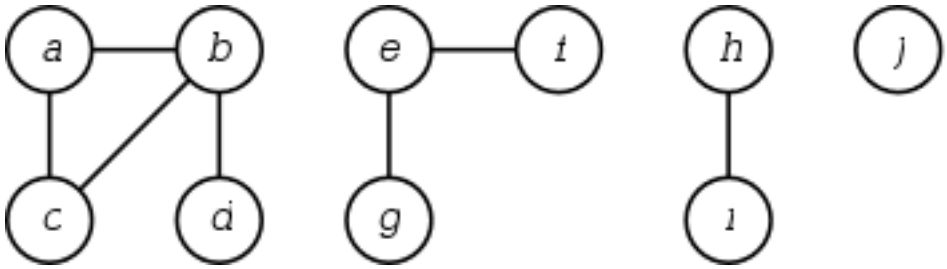
Assignment-3

Designed By – Deepak Uniyal (Assistant Professor CSE – GEU)

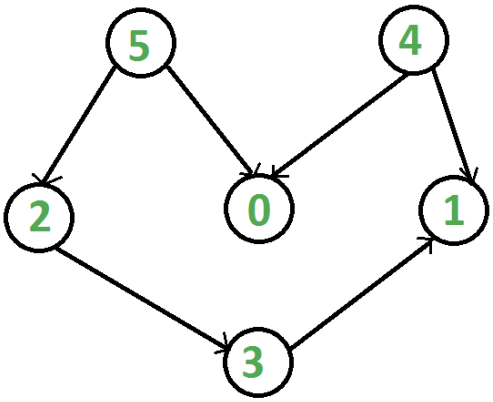
1. What is difference between DFS and BFS. Please write the applications of both the algorithms.
2. Which Data structures are used to implement BFS and DFS and why?
3. What do you mean by sparse and dense graphs? Which representation of graph is better for sparse and dense graphs?
4. How can you detect a cycle in a graph using BFS and DFS?
5. What do you mean by disjoint set data structure? Explain 3 operations along with examples, which can be performed on disjoint sets.



6. Run BFS and DFS on graph shown on right side (Graph with 8 vertices).
7. Find out the number of connected components and vertices in each component using disjoint set data structure.



8. Apply topological sorting and DFS on graph having vertices from 0 to 5 [**Hint** - Read http://interactivepython.org/runestone/static/pythonds/Graphs/TopologicalSorting.html].



9. Heap data structure can be used to implement priority queue? Name few graph algorithms where you need to use priority queue and why?
10. What is the difference between Max and Min heap?

Note - Read https://www.studytonight.com/cpp/stl/ to study STL. Read Iterators, Array, Vectors, Pair, List, Queue, Map, Priority Queue and algorithms like sort and search.