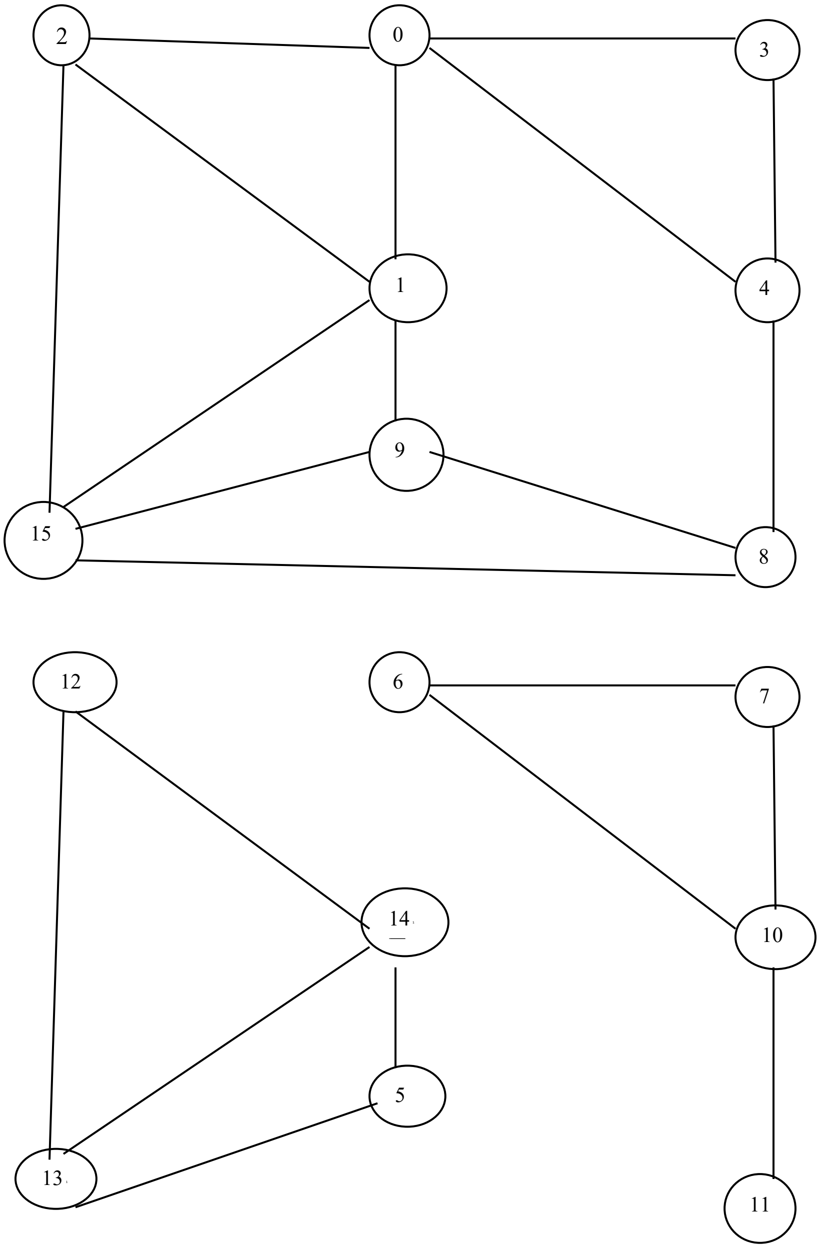
Programming Assignment - 12

Undirected graphs

1) Undirected Graphs



Use the above graph for the following questions. whenever there's a choice of vertices pick the one that is numerically smaller first. Classify each edge as a tree edge or a back edge, and give **pre** and **post** number of each vertex.

1) Draw, in the style of the figure in the text (page 524), the adjacency lists built by Graph's input stream constructor for the graph presented above.

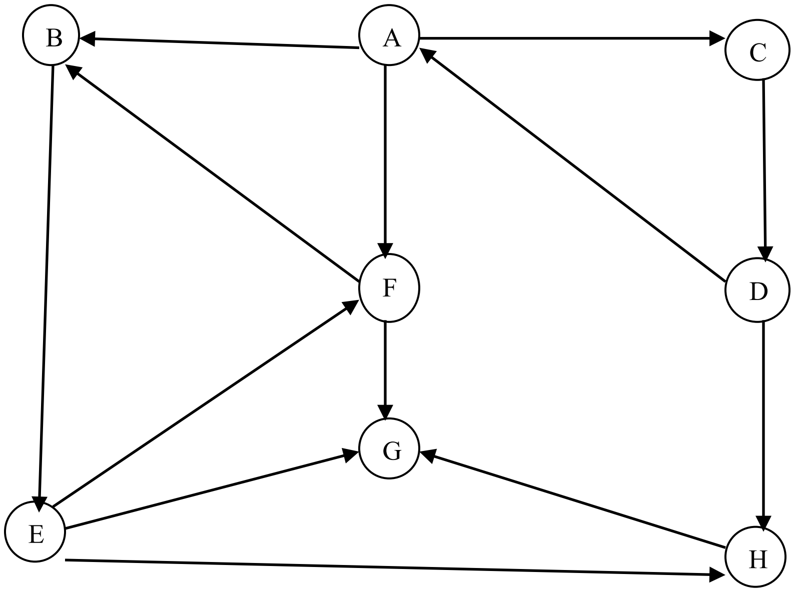
2) Show, in the style of the figure on page 533, a detailed trace of the call dfs(0) for the above graphs. Also, draw the tree represented by edgeTo[].

3) Draw the tree represented by edgeTo[] after the call bfs(G, 0) in Algorithm 4.2 for the above graph.

4) Show, in the style of the figure on page 545, a detailed trace of CC for finding the connected components in the above graph.

5) Show, in the style of the figures in this section, a detailed trace of Cycle for finding a cycle in the above graph.

2) Directed Graphs



Use the above graph for the following questions. Whenever there's a choice of vertices pick the one that is alphabetically first.

1) Draw, in the style of the figure in the text, the adjacency lists built by Graph's input stream constructor for the graph presented above.

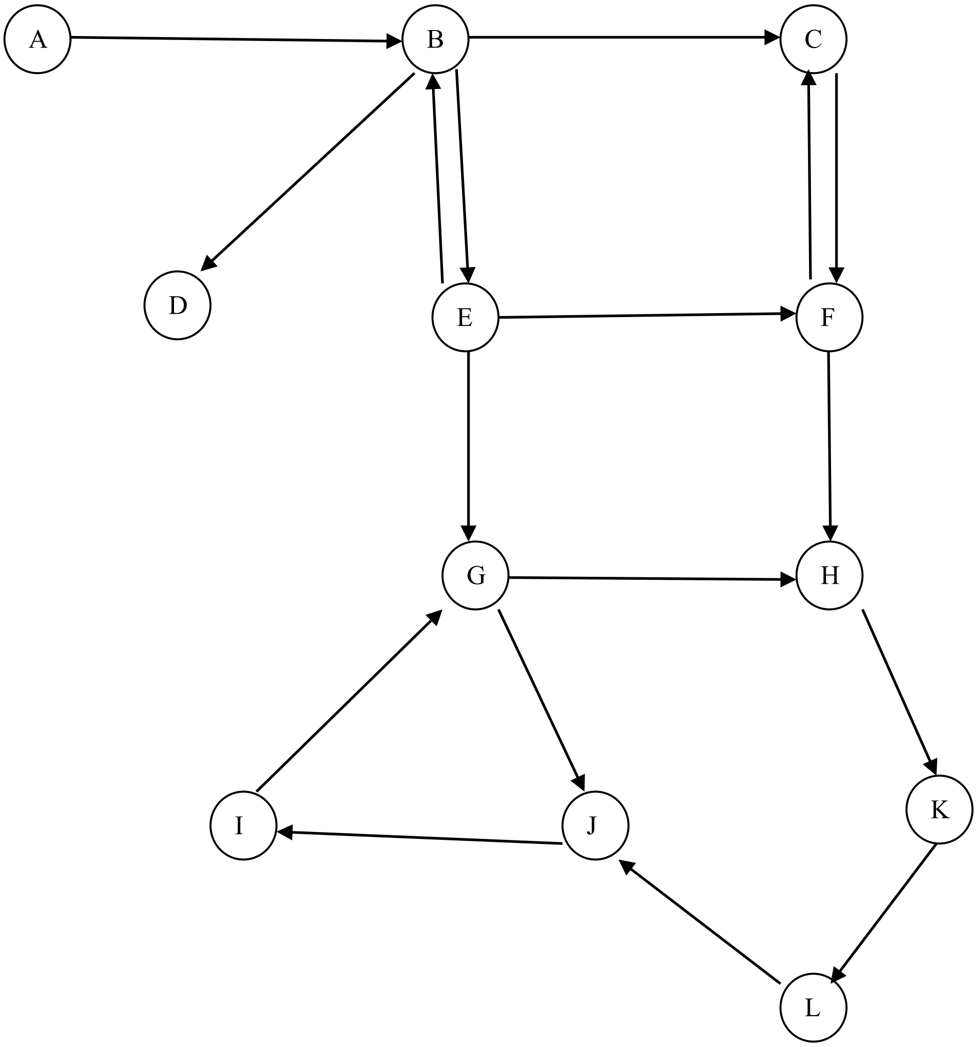
2) Show, in the style of the figures in the text, a detailed trace of the call dfs(A) for the above graphs. Also, draw the tree represented by edgeTo[]. Classify each edge as a tree edge or a back edge, and give **pre** and **post** number of each vertex.

3) Draw the tree represented by edgeTo[] after the call bfs(G, A) for the above graph.

4) Show, in the style of the figures on text, a detailed trace of strong components for finding the strongly-connected components in the above graph.

3) Strongly-Connected Components

Run a strongly connected components algorithm on the following directed G. Whenever there is a choice of vertices to explore, always pick the one that is alphabetically first. Start from vertex A. Show the trace at every step as shown in the textbook.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