Data Structure Assignment 6

Paper Homework

1. Show that given that $|V(G)|$ = n, a spanning tree has n–1 edges.

   The definition of the spanning tree:

   1. Any tree that consists solely of edges in graph G and that includes all the vertices in G.
   2. A minimal subgraph, G’ , of G such that V(G’) = V(G) and G’ is connected.

   The minimum number of edges(e) required for a graph to be connected is at least n – 1 (e >= n - 1), so if e < n – 1, the graph won’t be connected(or it won’t include all the vertices), and if e > n – 1, there will be a cycle(or more) in the graph, the grpah will still be connected after removing an edge on a cycle, hence it’s not minimal, so a spanning tree can only have n – 1 edges, no more and no less.

2. Given a dfs spanning tree(Figure6.20(b)), complete the following table of it.

Vertex	0	1	2	3	4	5	6	7	8	9
dfn	4	3	2	0	1	5	6	7	9	8
low	4	0	0	0	0	5	5	5	9	8

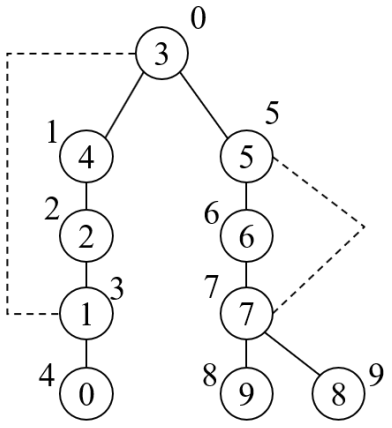

Figure 6.20(b)