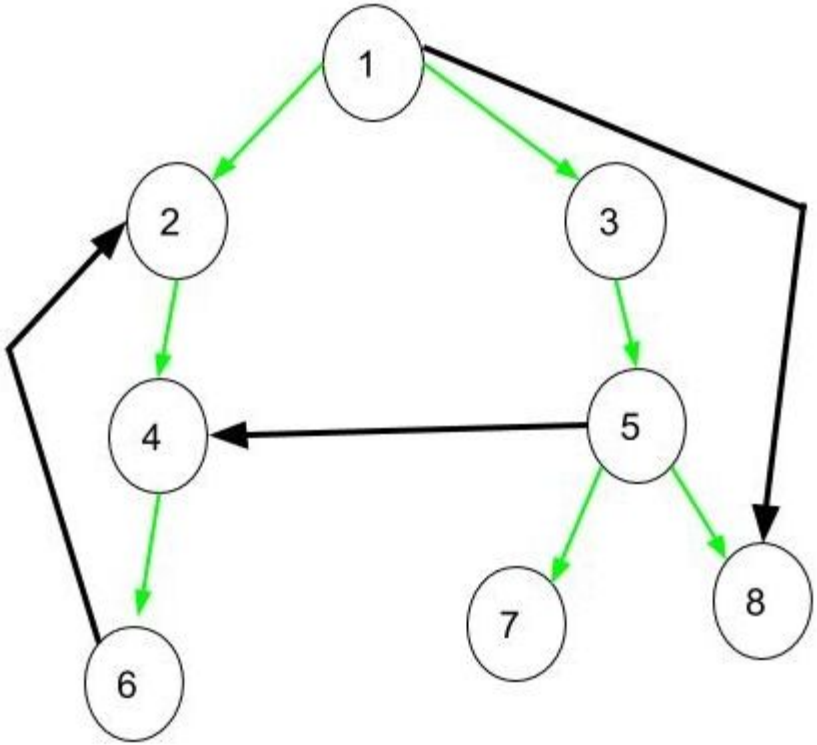
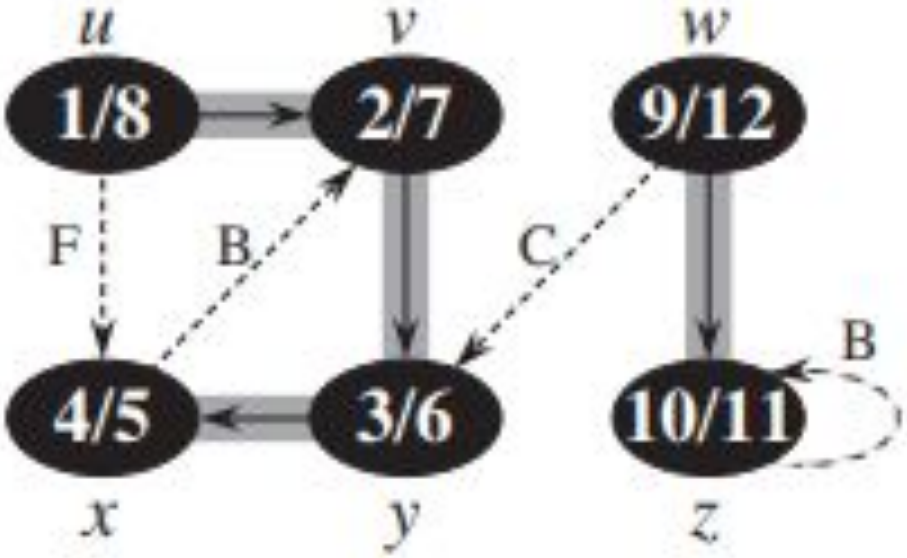
Graph


1
2
3
4
5
6
7
8

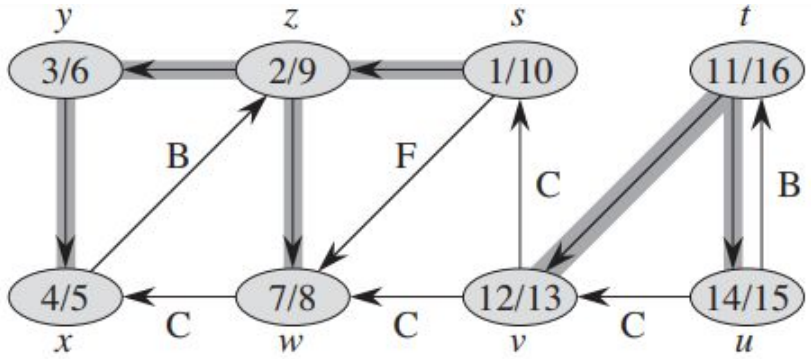
- **Tree Edge**: It is an edge which is present in the tree obtained after applyi on the graph. All the Green edges are tree edges.
- **Forward Edge**: It is an edge (u, v) such that v is a descendant but not par DFS tree. An edge from **1 to 8** is a forward edge.
- **Back edge**: It is an edge (u, v) such that v is the ancestor of node u but is n of the DFS tree. Edge from **6 to 2** is a back edge. Presence of back edge i a cycle in directed graph.
- **Cross Edge**: It is an edge that connects two nodes such that they do not h ancestor and a descendant relationship between them. The edge from no **4** is a cross edge.

1. ***Tree edges*** are edges in the depth-first forest G_π. Edge (u, v) is a tree edge if v was first discovered by exploring edge (u, v).
2. ***Back edges*** are those edges (u, v) connecting a vertex u to an ancestor v in a depth-first tree. We consider self-loops, which may occur in directed graphs, to be back edges.
3. ***Forward edges*** are those nontree edges (u, v) connecting a vertex u to a descendant v in a depth-first tree.
4. ***Cross edges*** are all other edges. They can go between vertices in the same depth-first tree, as long as one vertex is not an ancestor of the other, or they can go between vertices in different depth-first trees.

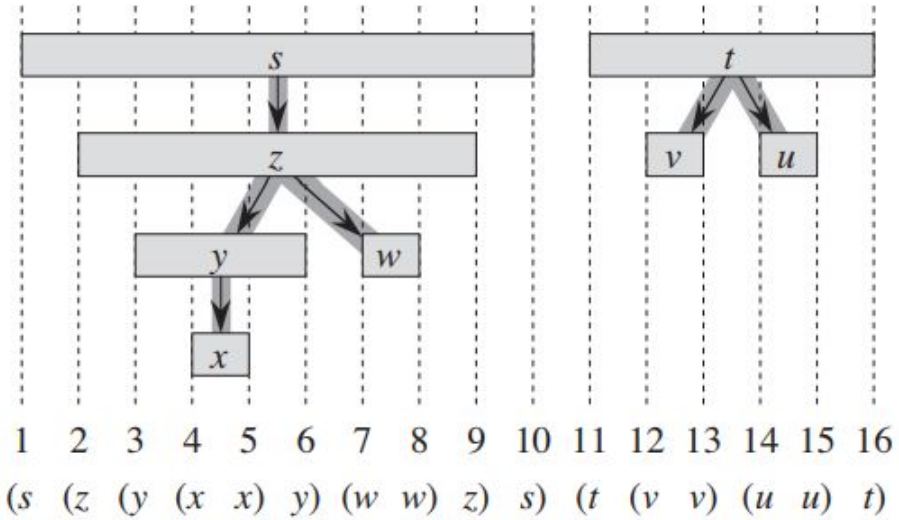


(p)

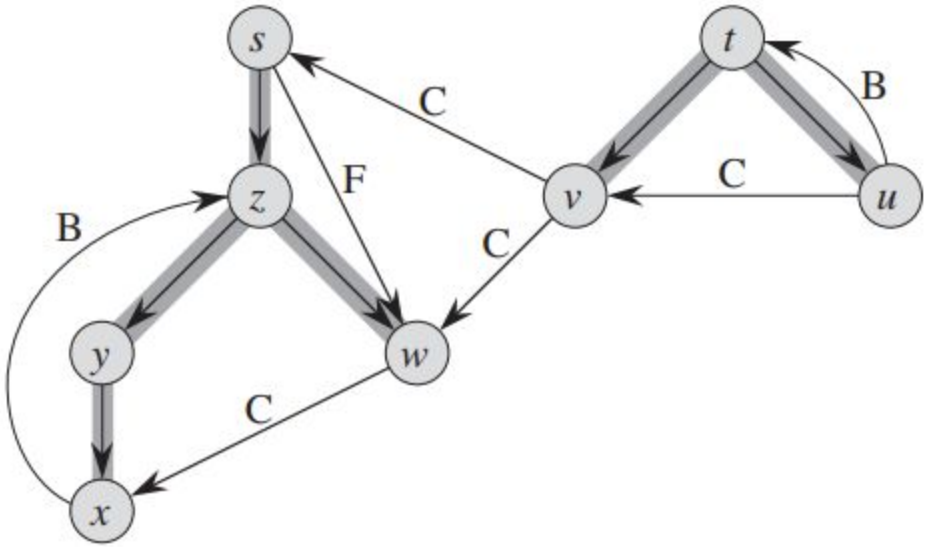
(a)

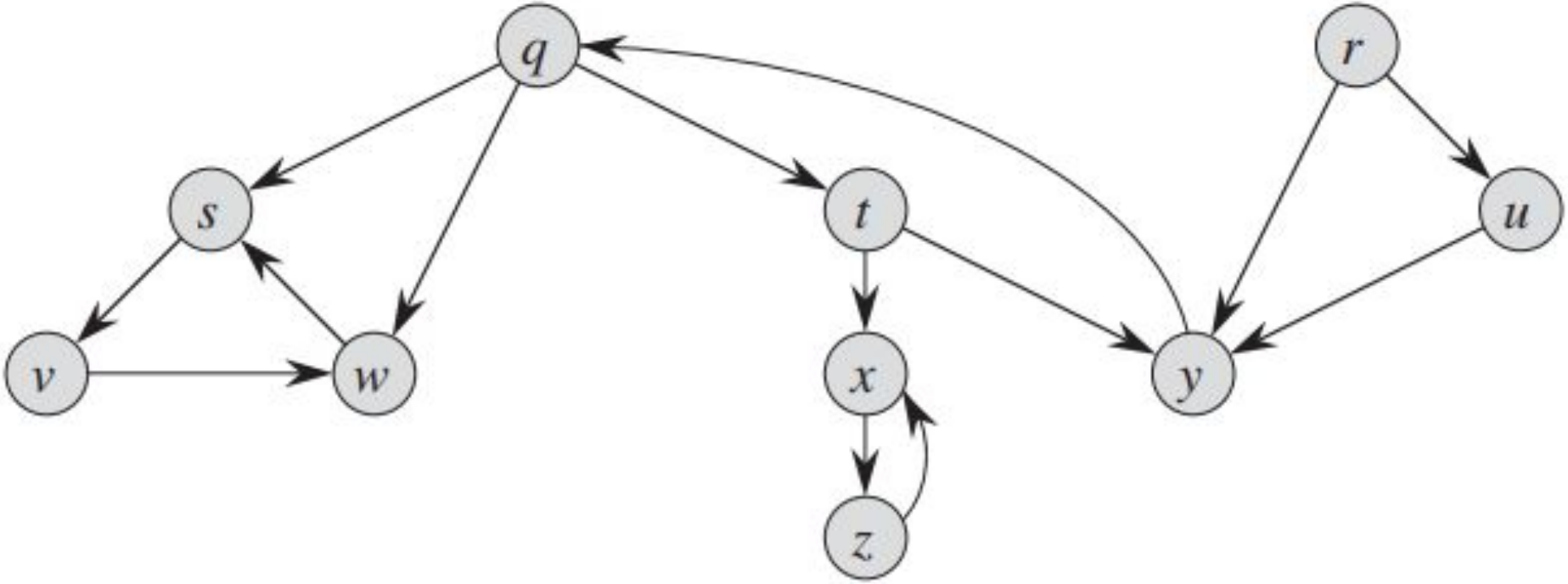

y
z
s
t
3/6
2/9
1/10
11/16
B
F
C
B
4/5
7/8
12/13
14/15
C
C
C
x
w
v
u

(b)


s
t
z
v
u
y
w
x
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
(s (z (y (x x) y) (w w) z) s) (t (v v) (u u) t)

(c)




q
r
s
t
u
v
w
x
y
z

Vertex	Discovered	Finished
q	1	16
r	17	20
s	2	7
t	8	15
u	18	19
v	3	6
w	4	5
x	9	12
y	13	14
z	10	11

- **Tree edges:** (q, s), (s, v), (v, w), (q, t), (t, x), (x, z), (t, y), (r, u).
- **Back edges:** (w, s), (z, x), (y, q).
- **Forward edges:** (q, w).
- **Cross edges:** (r, y), (u, y).