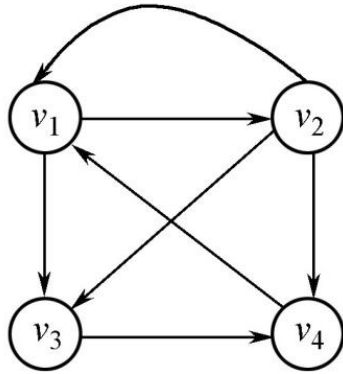


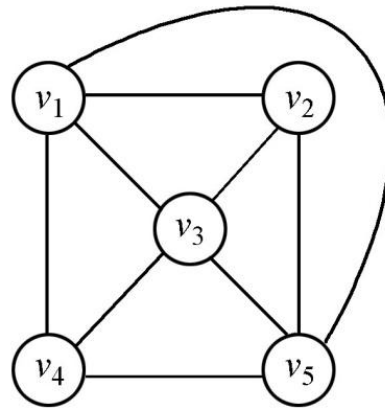
## Exercises 7

(1) The following assignments must be submitted by you.

(a) Please draw the adjacency matrix representation for the following graph  $G_1$  and  $G_2$  shown in Fig.1, respectively.



(a) 有向图  $G_1$



(b) 无向图  $G_2$

Fig.1

(b) The result of topological sorting is not unique, there are more than 52 species of the topological sequences of the graph shown in Fig.2. Please try to write down 5 species.

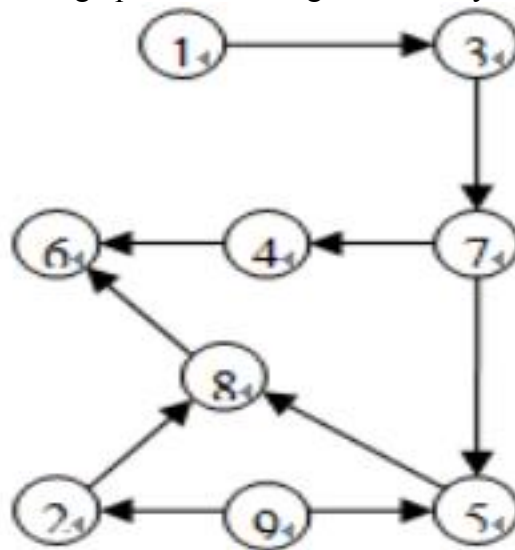


Fig.2

(c) Show the shortest paths generated by running Dijkstra's shortest-paths algorithm on the following graph shown in Fig.3, beginning at Vertex 0. And show the distance values as each vertex is processed.

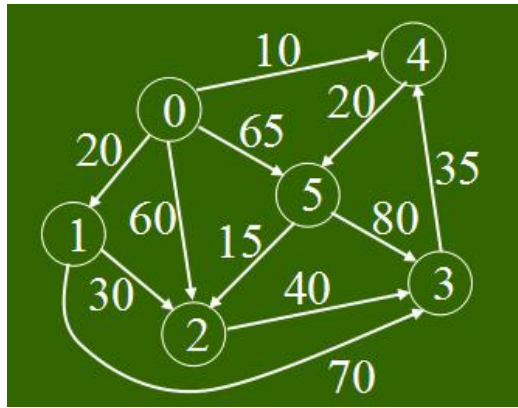


Fig.3

(d) Please list the order in which the edges of the graph shown in Fig.4 are visited when running respectively Prim's MST algorithm (普里姆最小生成树算法) and kruskal's MST algorithm (克鲁斯卡尔最小生成树算法) starting at Vertex 1, and show the final MSTs, respectively.

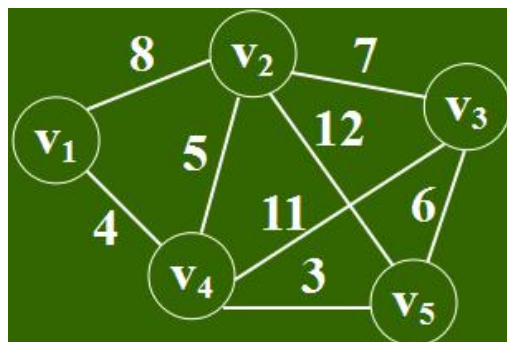


Fig.4

(e) Please give the BFS tree (广度优先遍历生成树) and the DFS tree (深度优先遍历生成树) for the same graph shown in Fig.5, respectively, starting at Vertex 1.

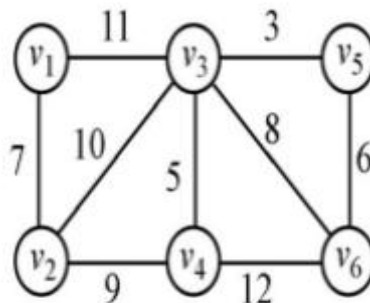


Fig.5

(f) For the graph shown in Fig.6: ①find the earliest start time  $e(i)$  and the latest start time  $l(i)$  of each event in the AOE network; ②How long is the earliest time to complete the project? ③which activities are the key activities? ④whether exists a certain activity, if you accelerate its speed, you can shorten the project time?

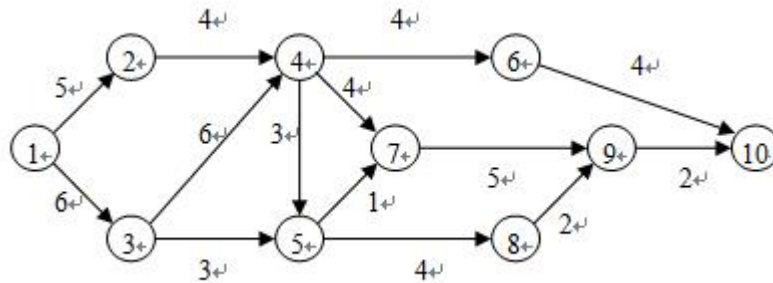


Fig.6