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**TNSL20 - basic logistic algorithms**  
**In Class Exercise Set October 10, 2017**

**Question 1 (BFS and DFS):**

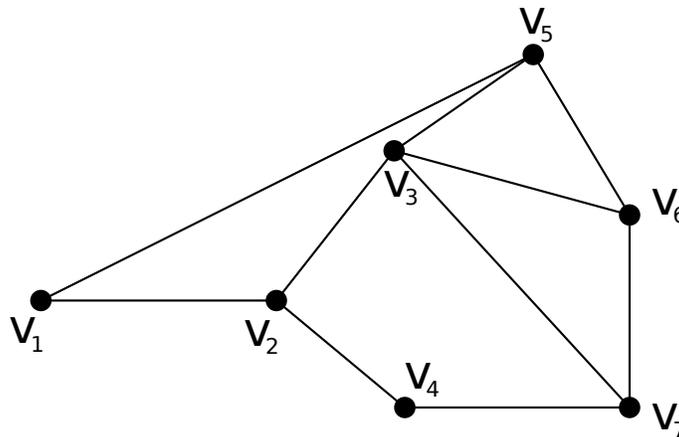


Figure 1: The graph  $H$ .

Apply DFS and BFS to the graph  $H$  from Figure 1; start with vertex  $v_1$ . If, at any time, you could choose more than one vertex for the next step, use the one with smallest index (that is, if you for example could choose  $v_2, v_4$  or  $v_5$  choose  $v_2$ ). Give the set  $Q$  every time it changes and draw the tree  $T$  you found.

**Question 2 (Maximum Flow):**

- (a) Use the algorithm from Edmonds-Karp to determine a maximum  $s$ - $t$ -flow in the network  $(G, c, s, t)$  from Figure 2. Give the residual graph for each step.
- (b) Use the algorithm from Edmonds-Karp to determine a maximum  $s$ - $t$ -flow in the network  $(H, c, s, t)$  from Figure 3. Give the residual graph for each step.

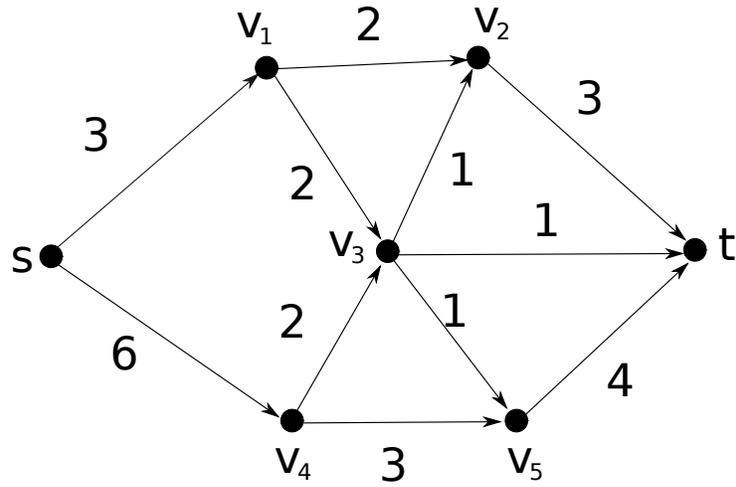


Figure 2: Network  $(G, c, s, t)$ . The numbers at the edges give the capacities.

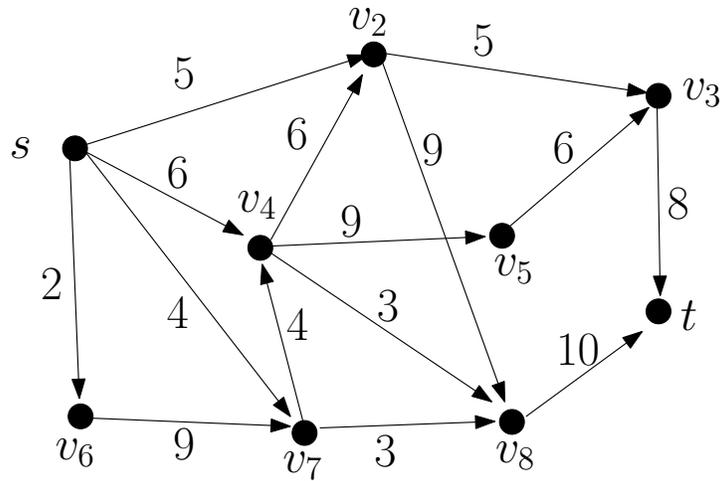


Figure 3: Network  $(H, c, s, t)$ . The numbers at the edges give the capacities.