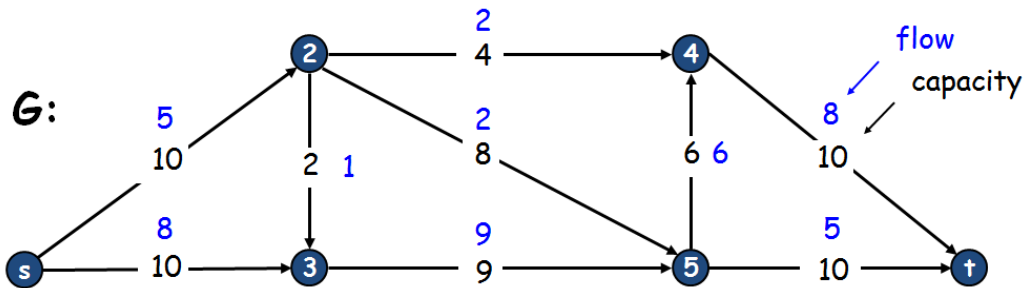


COT5405: Homework 4 (Fall 2017)

1. **Ford-Fulkerson Algorithm:** Study the example on slides 'ch7-maxflow.ppt'. The same graph is used for this question. Suppose the flow values (blue numbers) on all edges at current step in running the Ford-Fulkerson algorithm.
 - a. Draw the corresponding Residual graph G_f and derive the overall Flow value.
 - b. Assume that the next augmenting path P on the Residual graph we find is Path $s \rightarrow 2 \rightarrow 4 \rightarrow 5 \rightarrow t$. Compute the new overall Flow value. Draw the updated graph G with the new flow values on all edges.
 - c. Then draw the new updated corresponding Residual graph G_f



2. Exercise 8 on page 418.
3. Exercise 9 on page 419.
4. Exercise 1, page 505
5. Explain why if $x_0 \Leftrightarrow x_1 \wedge x_2 \Rightarrow$ add 3 clauses to the CNF: $\overline{x_0} \vee x_1, \overline{x_0} \vee x_2, x_0 \vee \overline{x_1} \vee \overline{x_2}$ (see slide 19, NP-Complete.pptx)