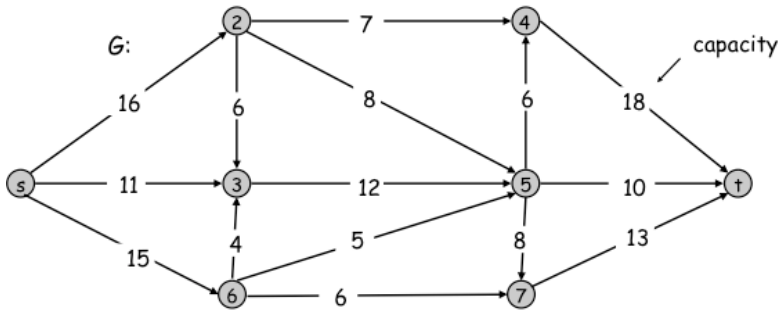
CIS522 Advanced Algorithm Design and Complexity

Name:_____ Learning Activity Last 3-Digit ID: 

Homework #6. Network Flow Practices. Submit in MyCourse.

Implement Ford-Fulkerson Algorithm in your chosen programming language. You may use existing online code but you must cite the sources.

a. Describe the implementation using pseudo code, including the following details: how to find argument path and how to update residual graph.
b. Based on the pseudo code, analyze the time complexity of this implementation.
c. Apply your algorithm to the network below and report the result: flow found and the value of the flow.



2. Read Section 7.11, solve the example problem below.

Project	Prerequisites	Profit
P1		-10
P2	P1	15
P3	P1, P2	-5
P4	P2	10
P5	P3	20

3. Read Solved Exercise 2 (doctor holiday assignment) on Page 412.
   a. Describe how to model this problem and how to solve it.
   b. Create a problem instance with 4 doctors and 3 holiday periods, fill out other required input details as you like,
   c. Convert this problem into a network flow problem, use the implementation in Question 1 to solve it and show the output result for the problem instance you created.

4. Chapter 7 Exercise 16 (advertisement problem), Page 422.
   a. Model this problem and describe how to solve it.
   b. Create a problem instance with k=4, n=15, m=5, and fill other details as you like.
   c. Convert this problem into a network flow problem, use the implementation in Question 1 to solve it and show the output result for the problem instance you created.

Must **type** your solution (handwritten texts are **not** acceptable)

- All solutions in one file, including the program output for each problem. (word or PDF), with your Full Name in filename.
- Source code in a separate file as the original readable text file.

Exercise Type: Preparation In Class Practice P27
Grade Type: Just for fun Boolean Numeric
Submission time: _____ Graded By:_____ Grade: _____