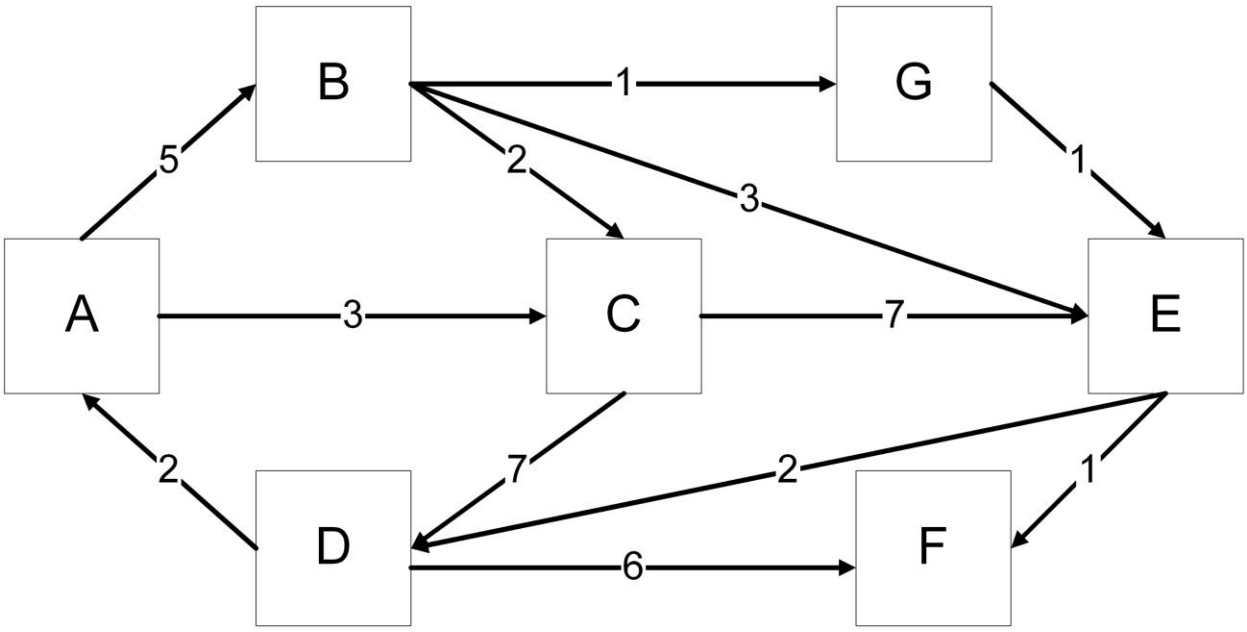
CMSC 341
Homework 6

1. (10 points) Show the result of the following sequence of UNION operations using union-by-weight with the following assumptions

- Unions are performed on the representatives on the sets that contain the arguments
- If the sets have the same weight, make the representative of the second argument point to the representative of the first argument.
- The universe of elements is the integers 0 - 16

a. Union(3, 5)
b. Union(1, 7)
c. Union(3, 6)
d. Union(8, 9)
e. Union(1, 8)
f. Union(3, 10)
g. Union(3, 11)
h. Union(3, 12)
i. Union(3, 13)
j. Union(14, 15)
k. Union(16, 0)
l. Union(14, 16)
m. Union(1, 3)
n. Union (1, 14)

2. (15 points) Answer the questions about the graph below.



a. (2 pts) Name one cycle that begins and ends at B.
b. (3 pts) True/False – the graph is **strongly connected**. If not, explain why not.
c. (10 pts) Find the shortest weighted paths from A to all other vertices. Your answer must include a list of all the vertices in order starting from A in each path and the weight of each path.