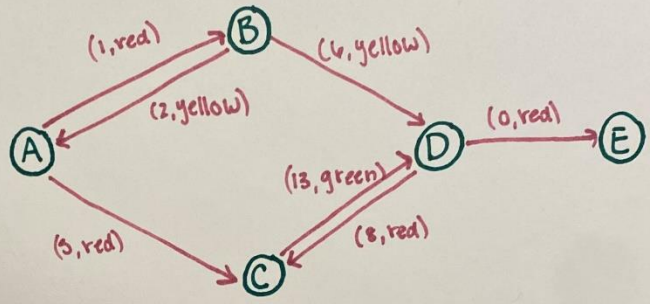
Morgan Baccus
CptS 300
Homework #10

Problem 1

We will use a tree structure to get the first shortest path.

U(From)	V(TO)
A	B
A	C
B	A
B	D
C	D
D	C
D	E



If we want a path ~~from~~ from A to E, we can do the following dynamic process.

	A	B	C	D	E
A	0	1	1	1	1
B	1	1	1	2	2
C	1	1	1	2	2
D	1	1	2	2	3
E	1	1	2	2	3

Then check if the last number is $\leq k$. If yes, return it. If not, modify the sequence and repeat the dynamic process.

Problem 2

To find the shortest path with no red edges followed by a yellow, we will:

a) Find all possible paths with no loops.

b) Remove any path with a red edge.

c) Return the shortest path.

Problem 3

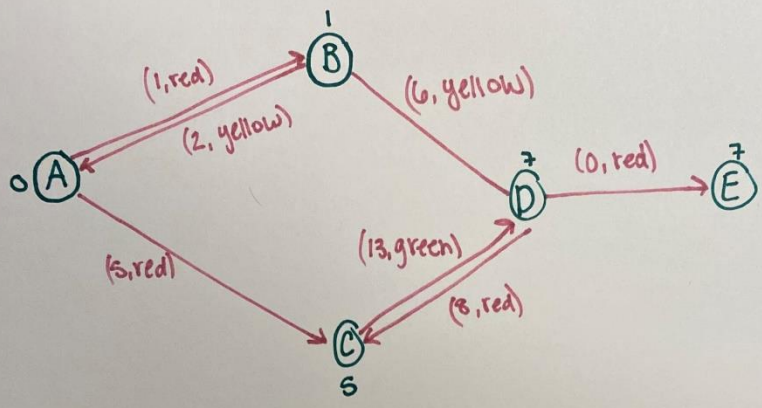
There are 2 possible situations...

① All possible paths do not contain a loop making the lengths finite. This allows us to ~~search~~ switch the paths to color paths and compute the size of each set.

② If any of the paths contain loops then its possible the graph can go forever and the possible paths are infinite. It is impossible to compute the size of the set in this situation.

Problem 4

We will shortest path algorithm using our example from Problem 1.



Potential path: A → B → D → E Total = 7
0 1 7 7

In this path, C is not visited so it doesn't work.

Potential path 2: A → C → D ... (did not get min number for D so terminate)
0 5 18