Name: shi qiu
Access ID: sbq5043
Recitation: 7

Problem 1

Points:

work with Zimeng Liu

"I did not consult anyone except my group members".

non-class material: https://www.geeksforgeeks.org/strongly-connected-components/

https://www.baeldung.com/cs/graph-connected-components

https://www.geeksforgeeks.org/shortest-path-for-directed-acyclic-graphs/

Problem 2

Points:

A

source is A B

sink is J G I

B)

ACFJDHGIBE

C)

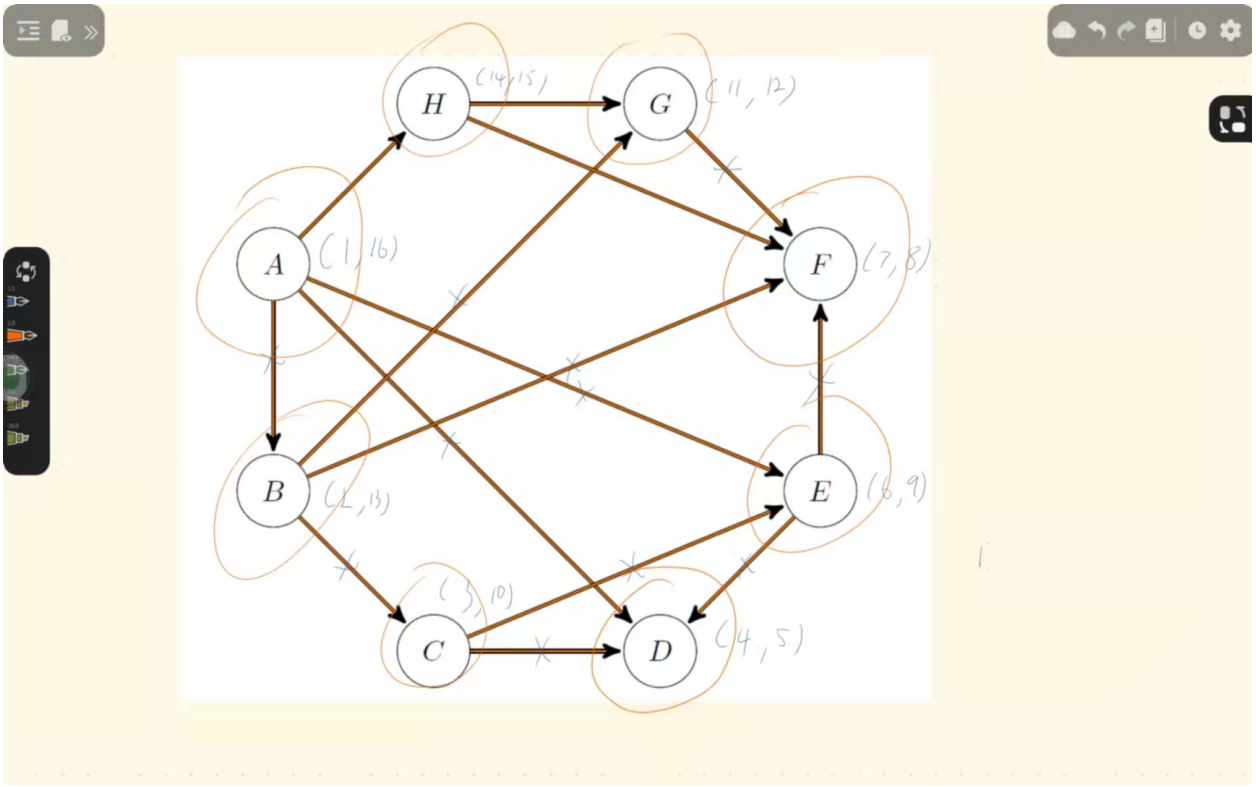
436

Problem 3

Points:

1 A(1,16) B(2,13) C(3,10) D(4,5) E(6,9) F(7,8) G(11,12) H(14,15)

2)



Problem 4 **Points:**

if we set i dollar bill as the initial vertices, and make the second accessible dollar bill($2) as the second vertices, we can continue the graph by make every new bill we access as a new vertices and the ways of print bills as edges.

For example, the first vertices is $1, second vertices is $2, and there is a edge between them.

The third vertices will be the value of $2^2 mod 400 = 4$, connect a edge between $2 and $4, forth vertices will be $5 and connect a edge between $2 and $5

as we continues, the map keeps going until there is no more accessible bill amount. so it will be back to the first vertices: 1

and we can run depth-first search with timing, to find if there exist a bill amount is 20

the running time will be $O(v^2)$