

2301 COL 202 Tutorial 9.4

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TOTAL POINTS

2 / 2

QUESTION 1

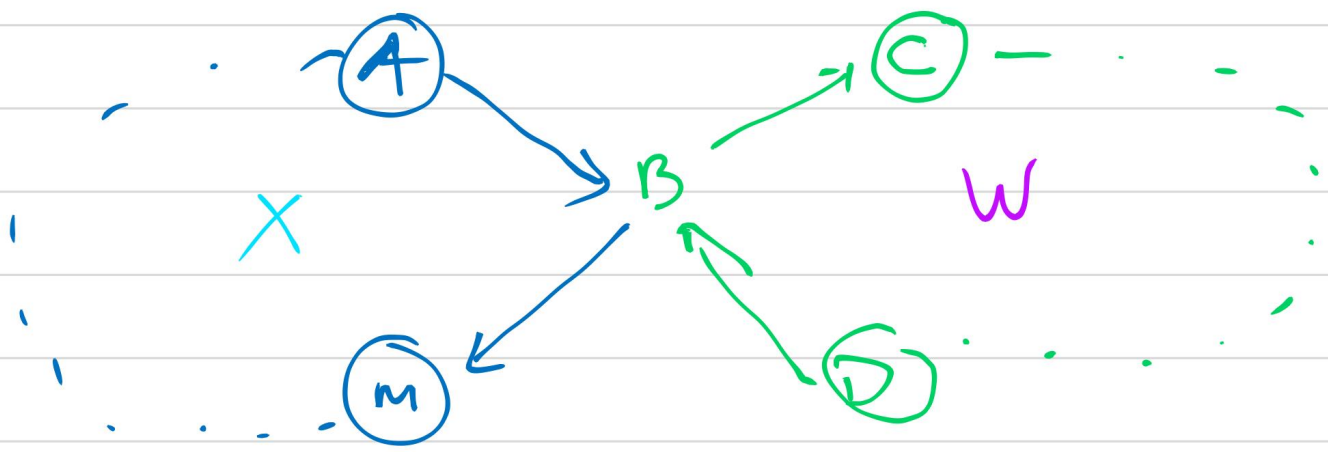
1 Problem for Group 4 **2 / 2**

✓ - **0 pts** Correct

- **2 pts** Incorrect

- **0.66 pts** 1 wrong

- **1.3 pts** 2 wrong



∴ Sum of length of walk X & W is odd,

∴ Exactly one of them is a closed walk of odd length. (say w)

Now, if w is a cycle, then we are done,
let w be not a cycle.

Then repeat the same analogy on w .

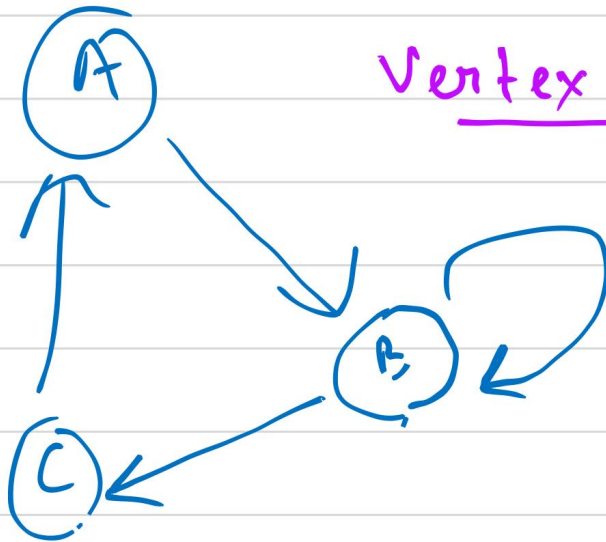
⇒ Clearly, as our case states that there are no self loops, so our

Tutorial 9

Problem 9.4

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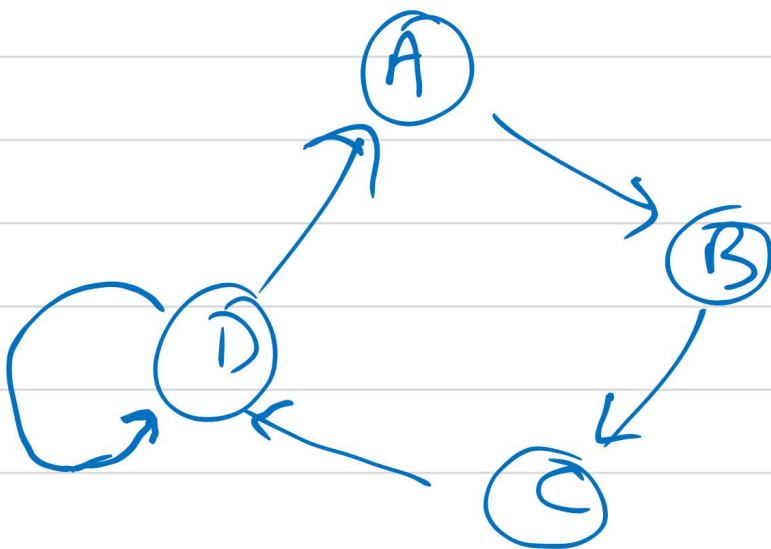
(a)



Vertex A has even
length closed
walk

$A \rightarrow B \rightarrow B \rightarrow C \rightarrow A$

(b)



Vertex B
is on odd
length closed
walk

$B \rightarrow C \rightarrow D \rightarrow D \rightarrow A$
↓
B

But B does not have any odd length cycle.

(c) Case 1: The closed walk ^{of odd length} is a cycle i.e. there are no repeated vertices on the path.

∴ The case is clear, any node on that walk will have a cycle of odd length

Case 2: The closed walk is not a cycle (And no node has self loop)

⇒ There would be at least one such node, which is repeated on the walk.

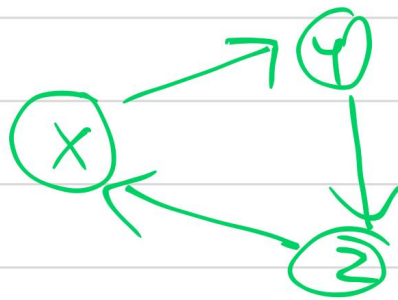
Say, B.

So, the walk comes to B, completely another closed walk (W) and completes the walk it came from. (X)

algorithm will terminate

if either the sub-closed walk (w) is a cycle

because smallest odd length walk is



\Rightarrow Clearly program will always terminate.

Case 3: When ^{at least 1} node has self loop

\Rightarrow  this is

a cycle of length 1

Condition satisfied.

Hence proved

1 Problem for Group 4 2 / 2

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