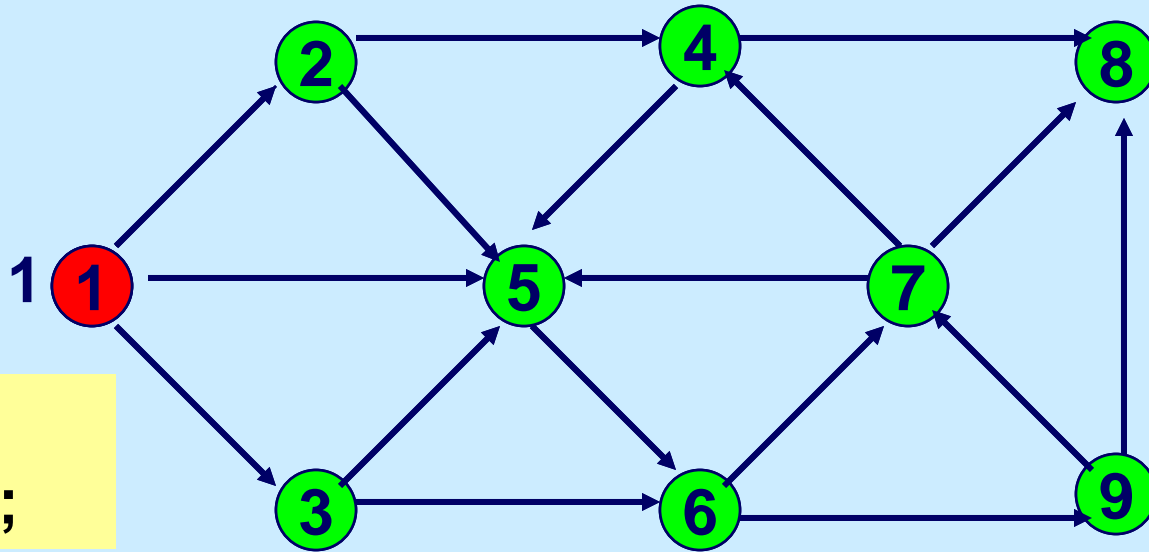


Network Optimization

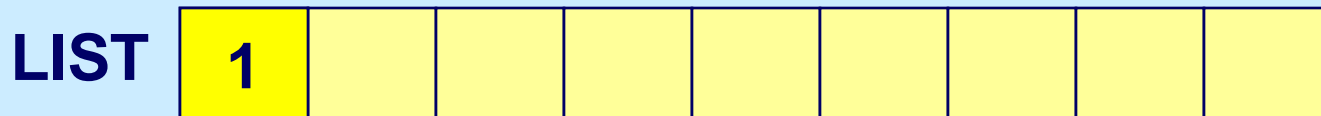
Depth First Search

Initialize

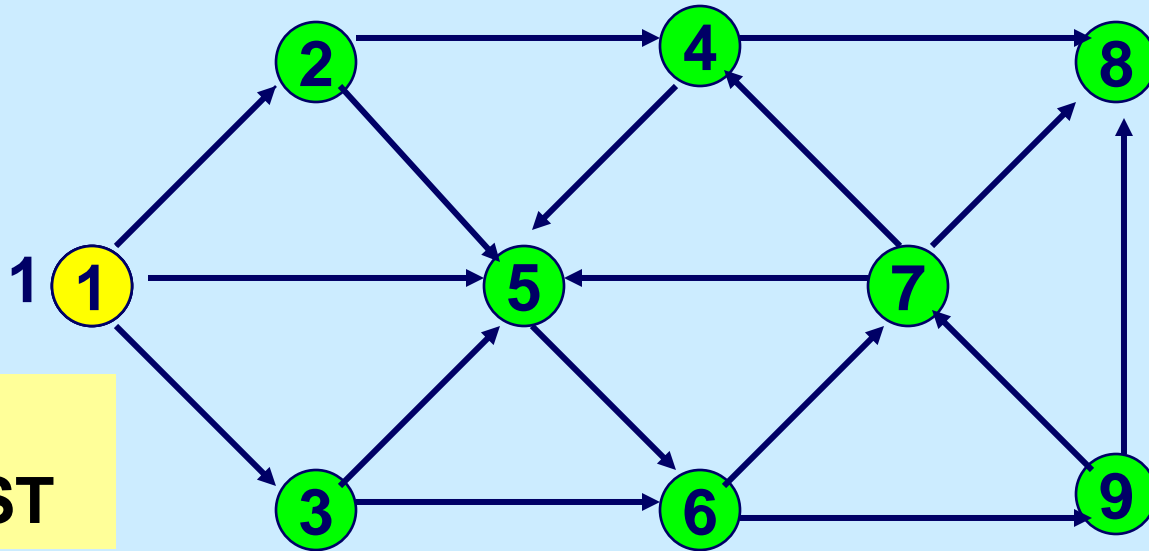


Unmark all nodes in N;

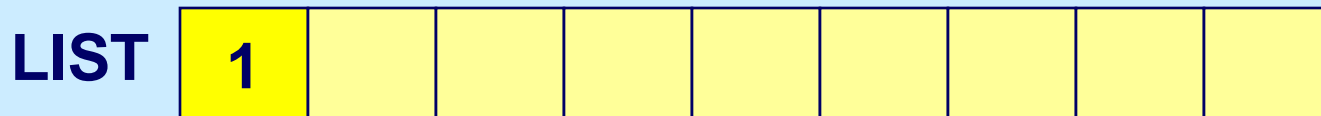
Mark node 1 and add it to LIST



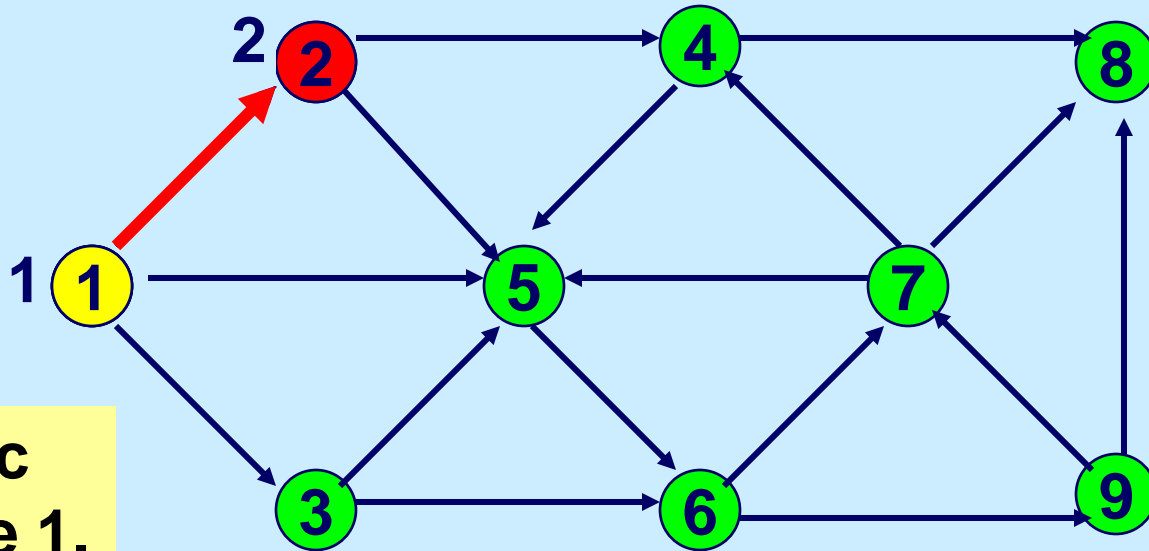
Select a node i in LIST



Select last
node in LIST



If node i is incident to an admissible arc...



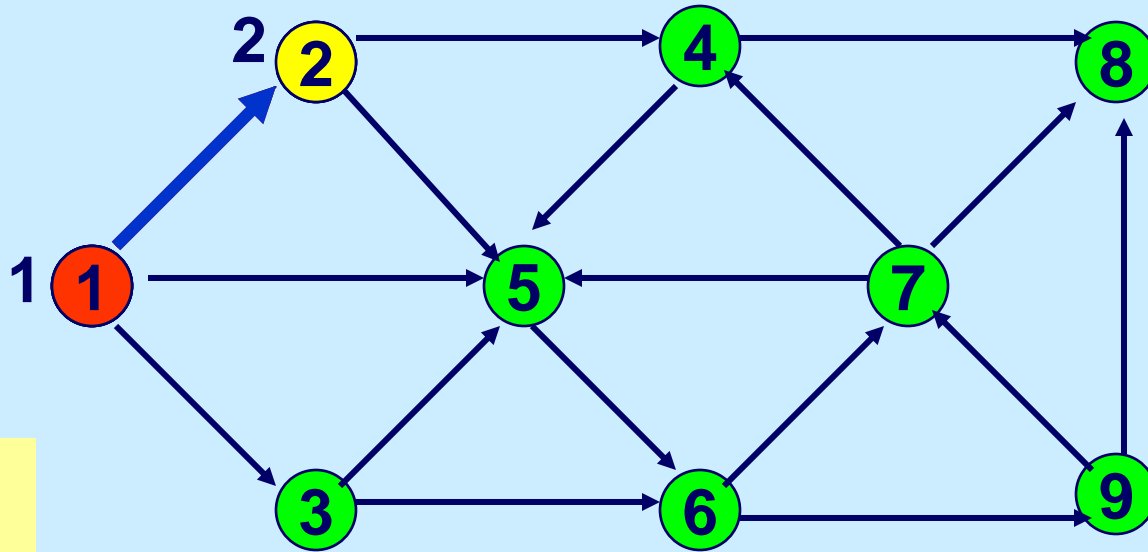
Scan an arc out of node 1.

If endpoint is unmarked, then mark it and add it to LIST.

LIST

1	2							
---	---	--	--	--	--	--	--	--

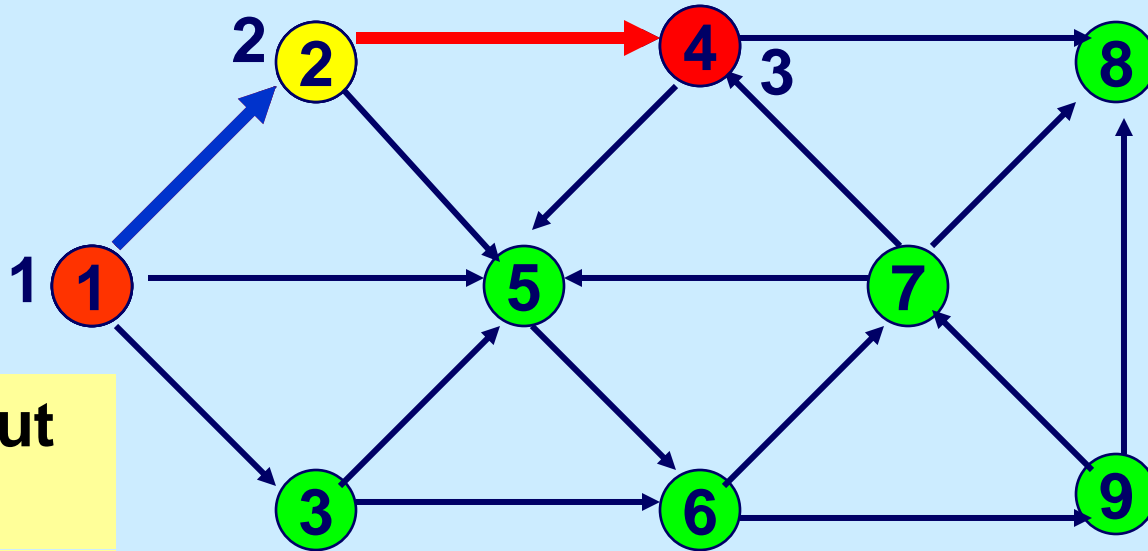
Select the last node on LIST



Select Node 2.

LIST	1	2							
------	---	---	--	--	--	--	--	--	--

If node i is incident to an admissible arc...



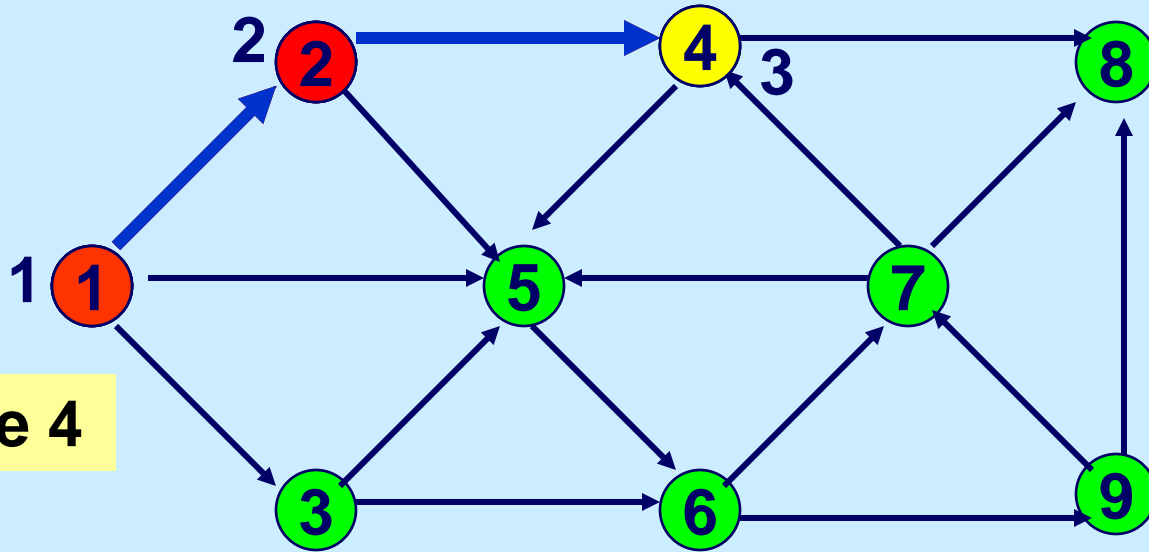
Scan arc out of node 2.

Mark node 4 and add it to LIST.

LIST

1	2	4						
---	---	---	--	--	--	--	--	--

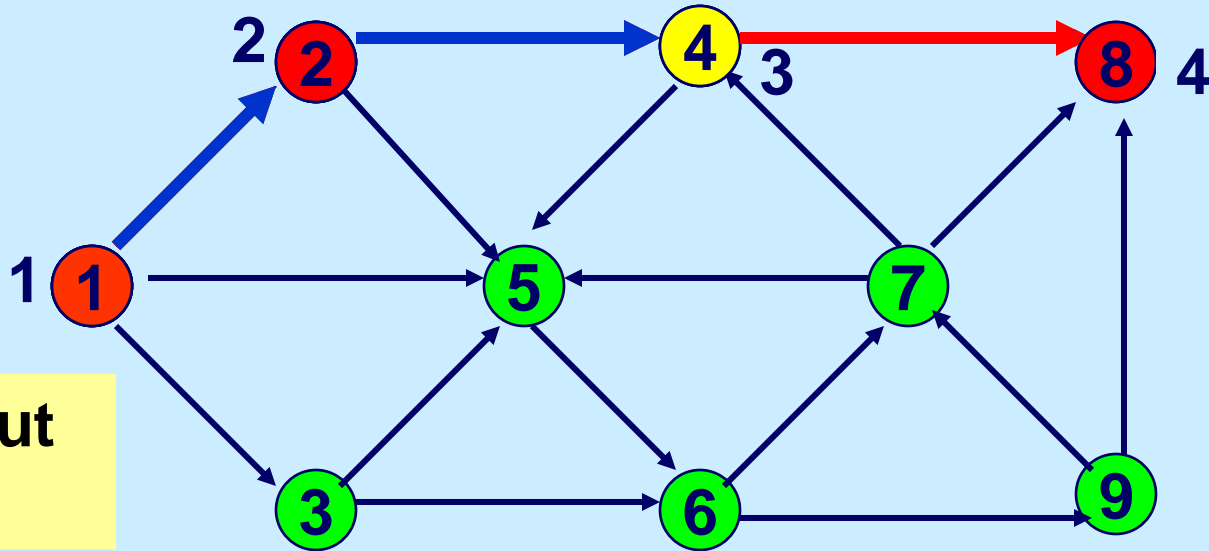
Select



LIST

1	2	4						
---	---	---	--	--	--	--	--	--

If node i is incident to an admissible arc...



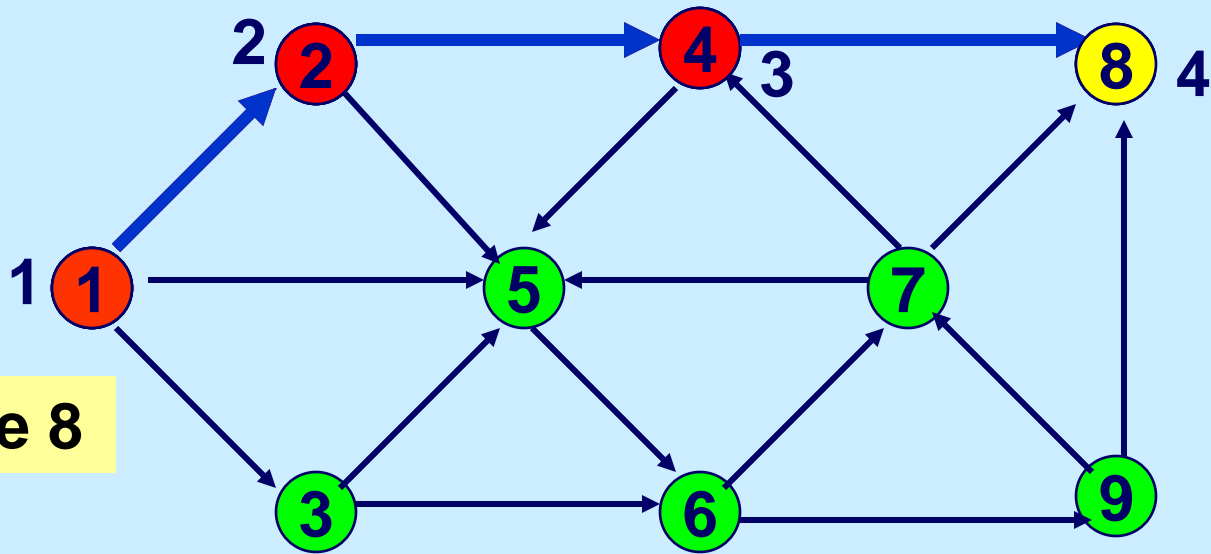
Scan arc out of node 4.

Mark 8 and add it to LIST.

LIST

1	2	4	8						
---	---	---	---	--	--	--	--	--	--

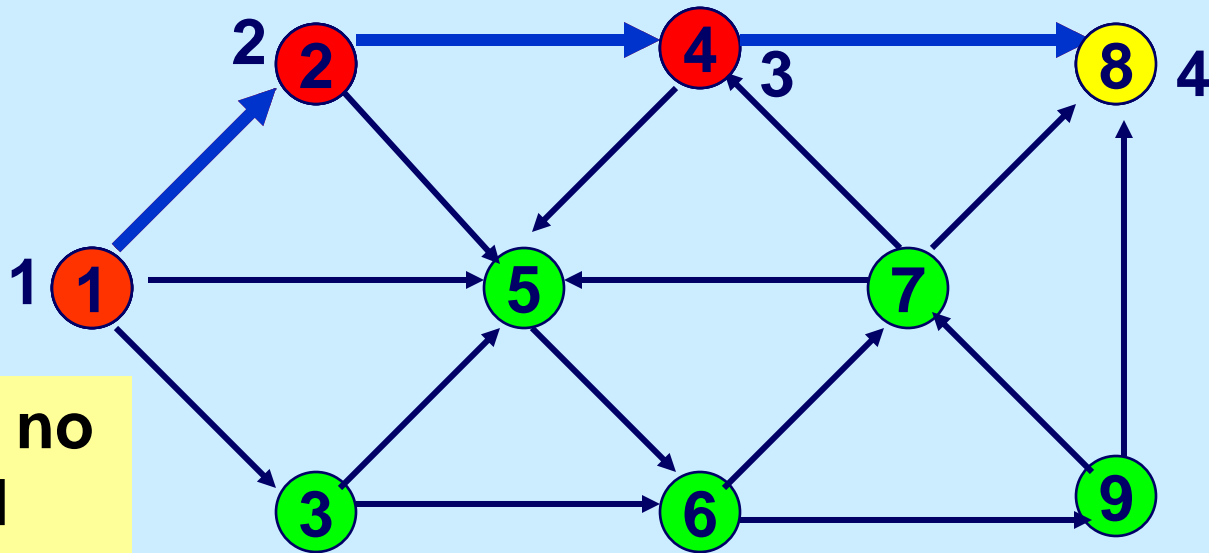
Select



LIST

1	2	4	8					
---	---	---	---	--	--	--	--	--

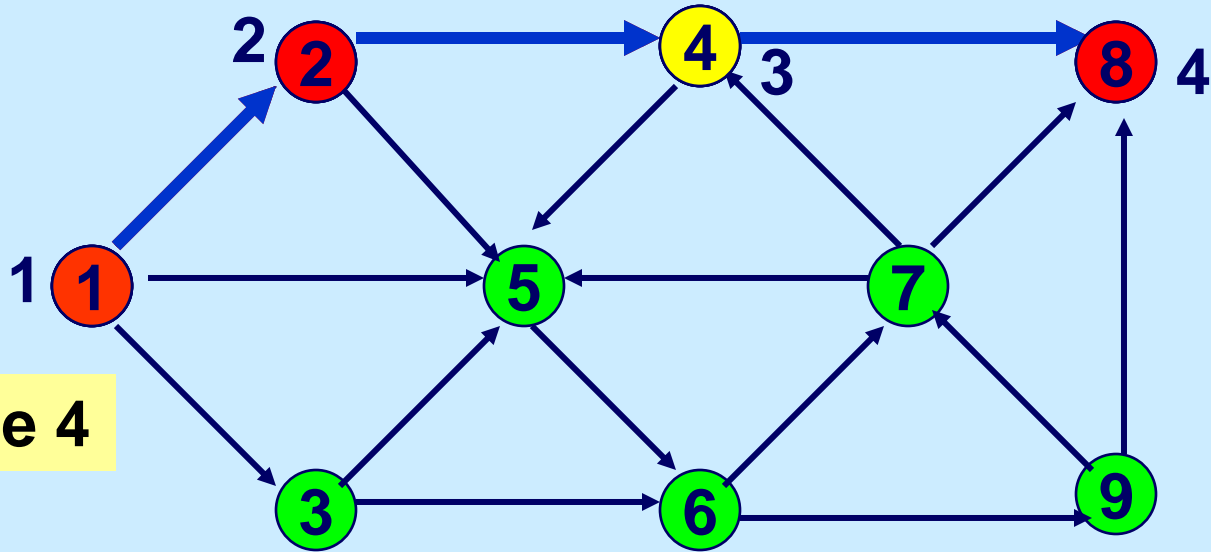
If node i is not incident to an admissible arc...



If there are no unscanned arcs out of node 8, delete it from LIST.



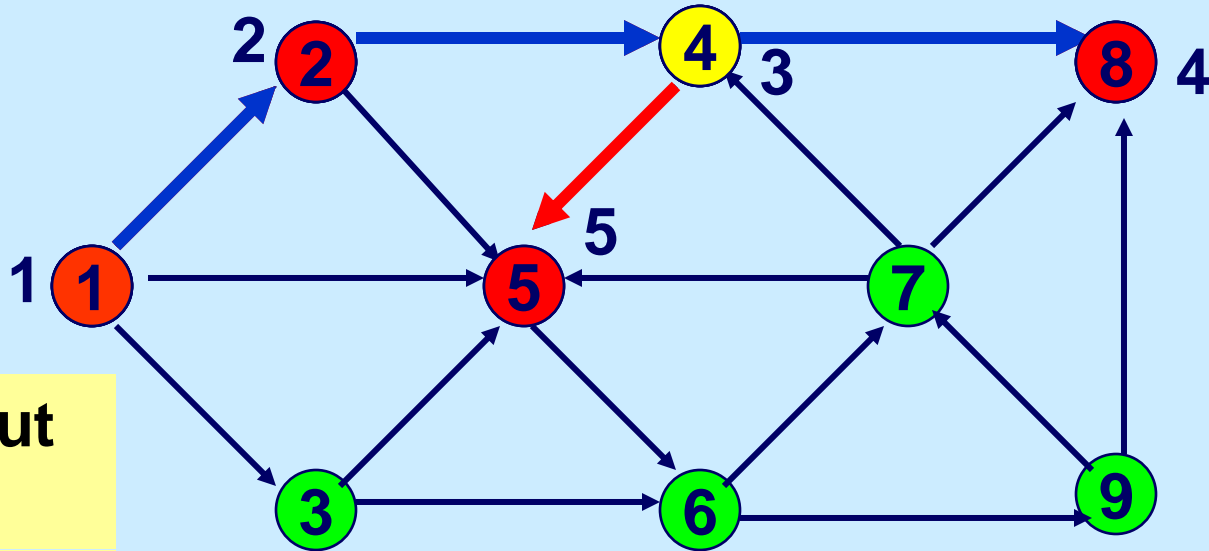
Select



Select Node 4

LIST	1	2	4						
------	---	---	---	--	--	--	--	--	--

If node i is incident to an admissible arc...



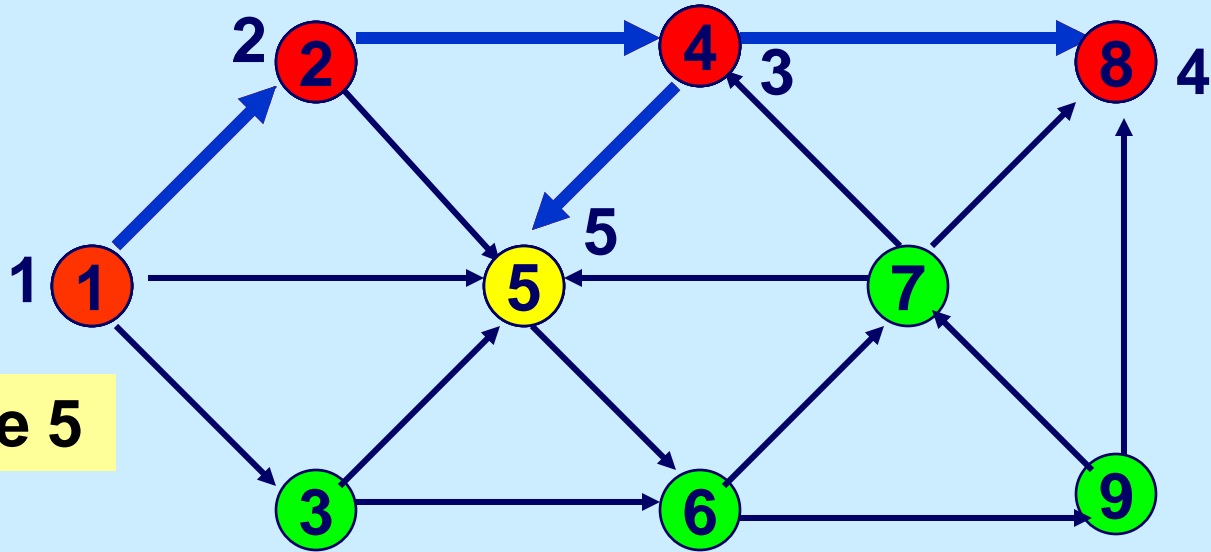
Scan arc out
of node 4.

Mark 5 and
add it to LIST.

LIST

1	2	4	5					
---	---	---	---	--	--	--	--	--

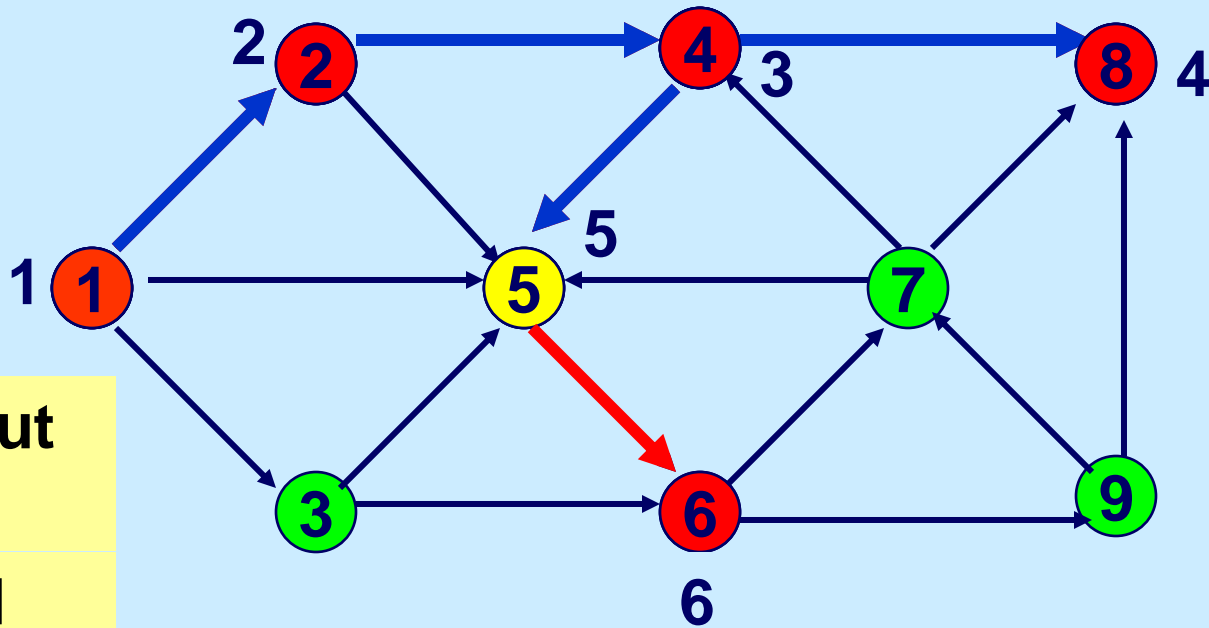
Select



Select node 5

LIST	1	2	4	5					
------	---	---	---	---	--	--	--	--	--

If node i is incident to an admissible arc...



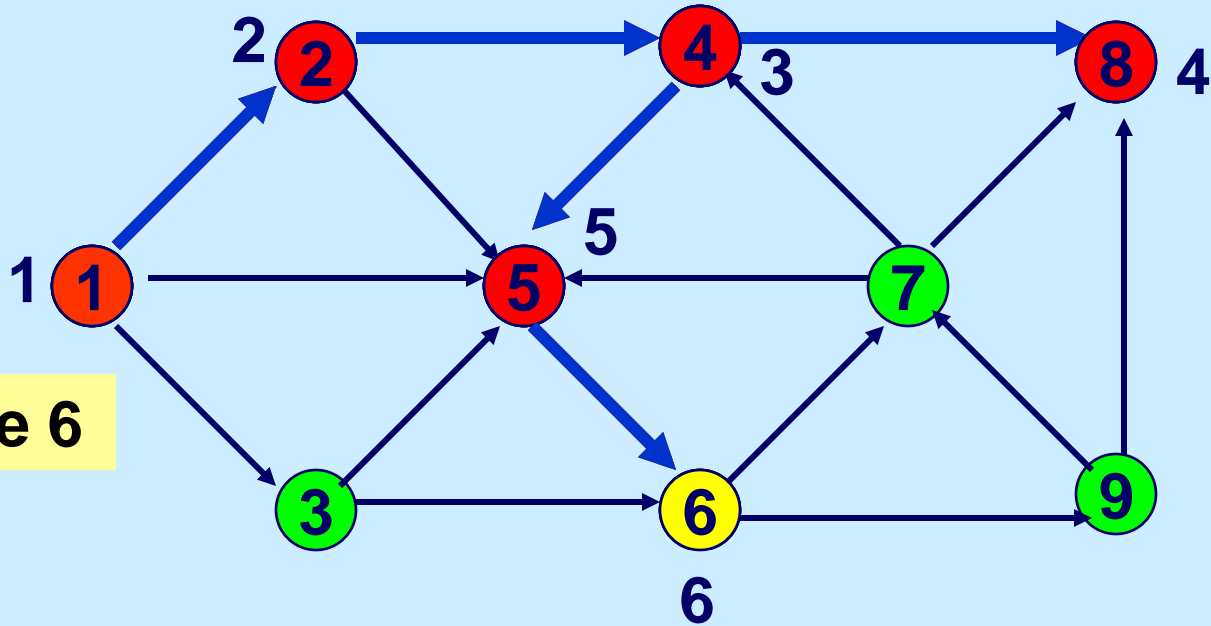
Scan arc out of node 5.

Mark 6 and add it to LIST.

LIST

1	2	4	5	6				
---	---	---	---	---	--	--	--	--

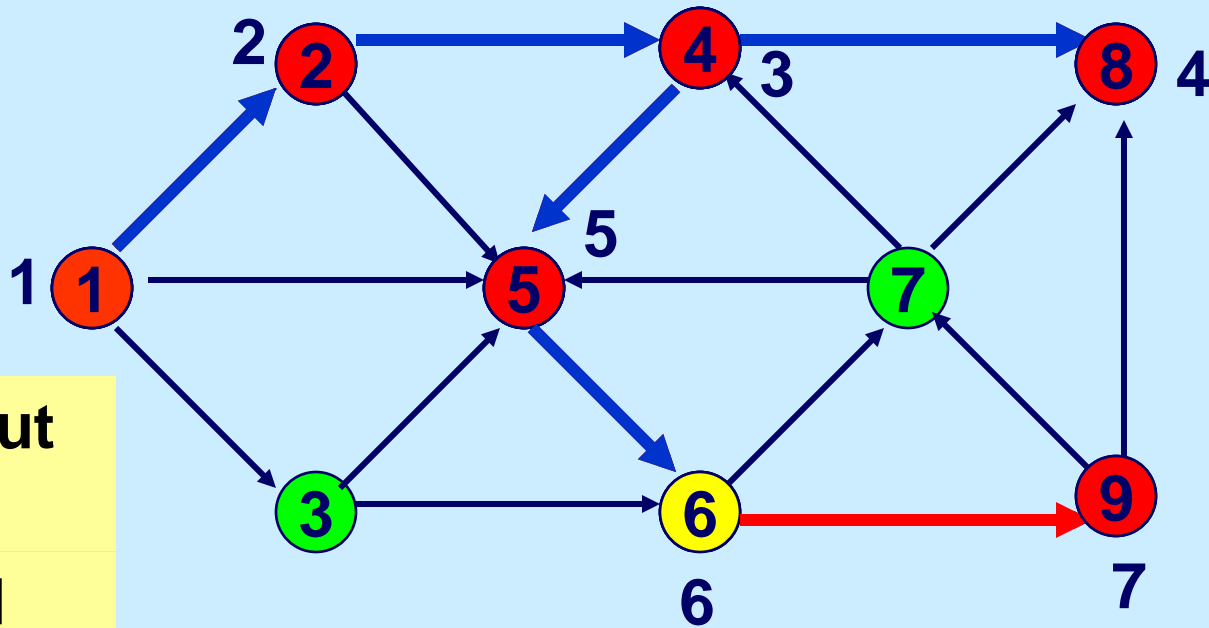
Select the last node on LIST



Select node 6

LIST	1	2	4	5	6				
------	---	---	---	---	---	--	--	--	--

If node i is incident to an admissible arc...



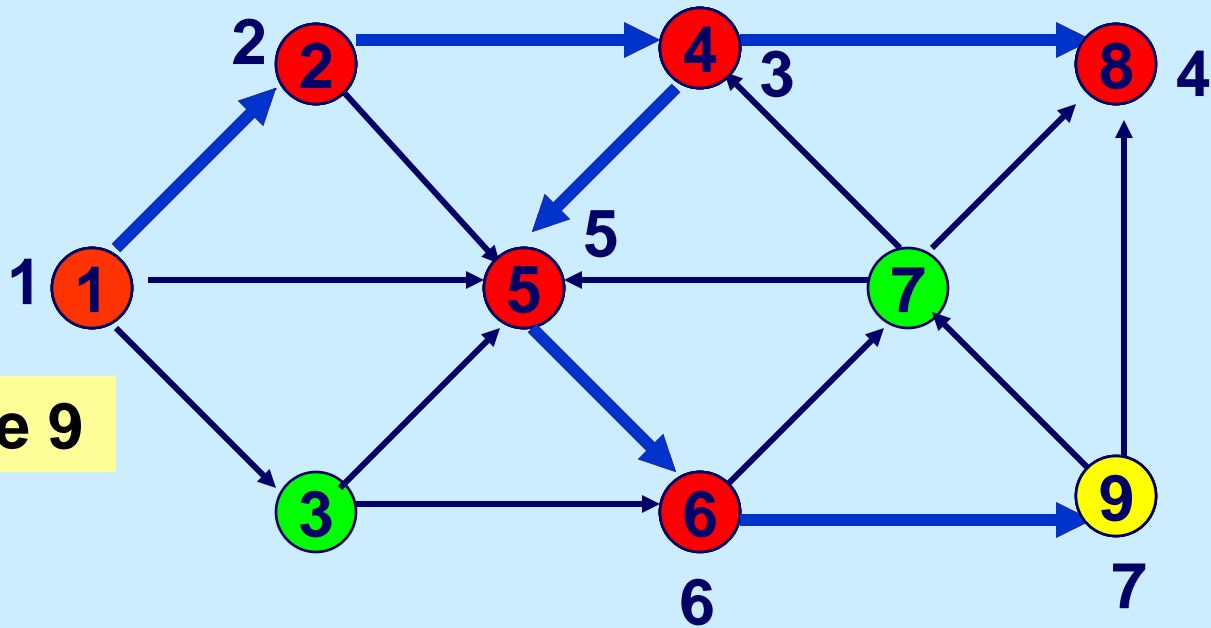
Scan arc out
of node 6.

Mark 9 and
add it to LIST.

LIST

1	2	4	5	6	9			
---	---	---	---	---	---	--	--	--

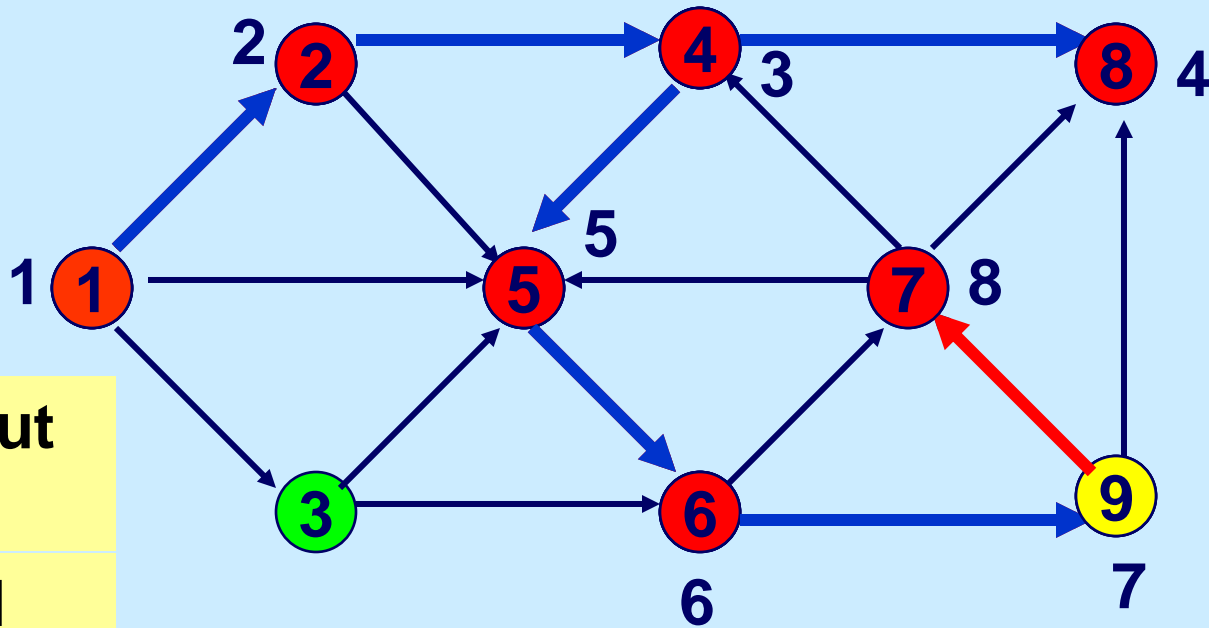
Select the last node on LIST



Select node 9

LIST	1	2	4	5	6	9			
------	---	---	---	---	---	---	--	--	--

If node i is incident to an admissible arc...



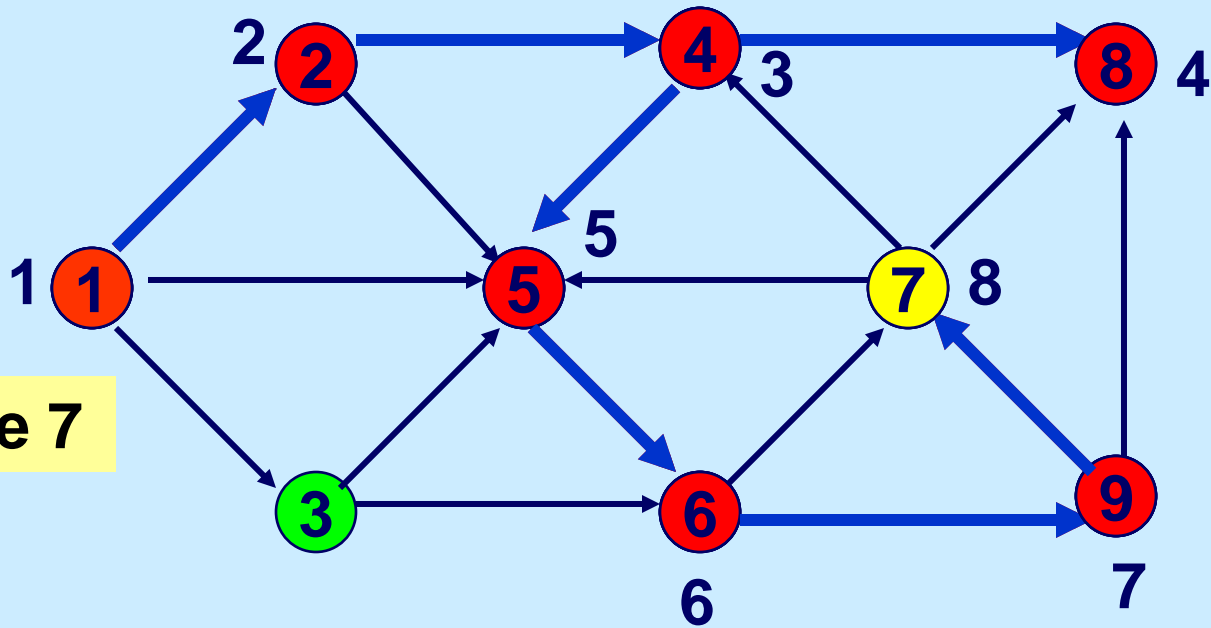
Scan arc out
of node 9.

Mark 7 and
add it to LIST.

LIST

1	2	4	5	6	9	7		
---	---	---	---	---	---	---	--	--

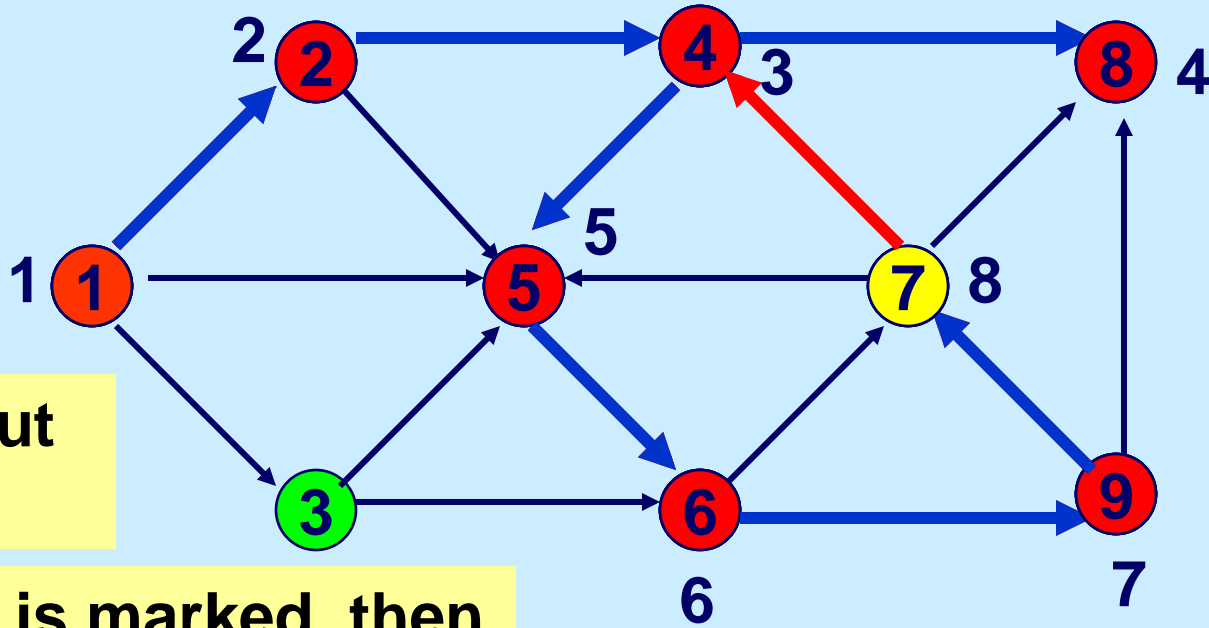
Select the last node on LIST



Select node 7

LIST	1	2	4	5	6	9	7		
------	---	---	---	---	---	---	---	--	--

Scan arc (7,4)



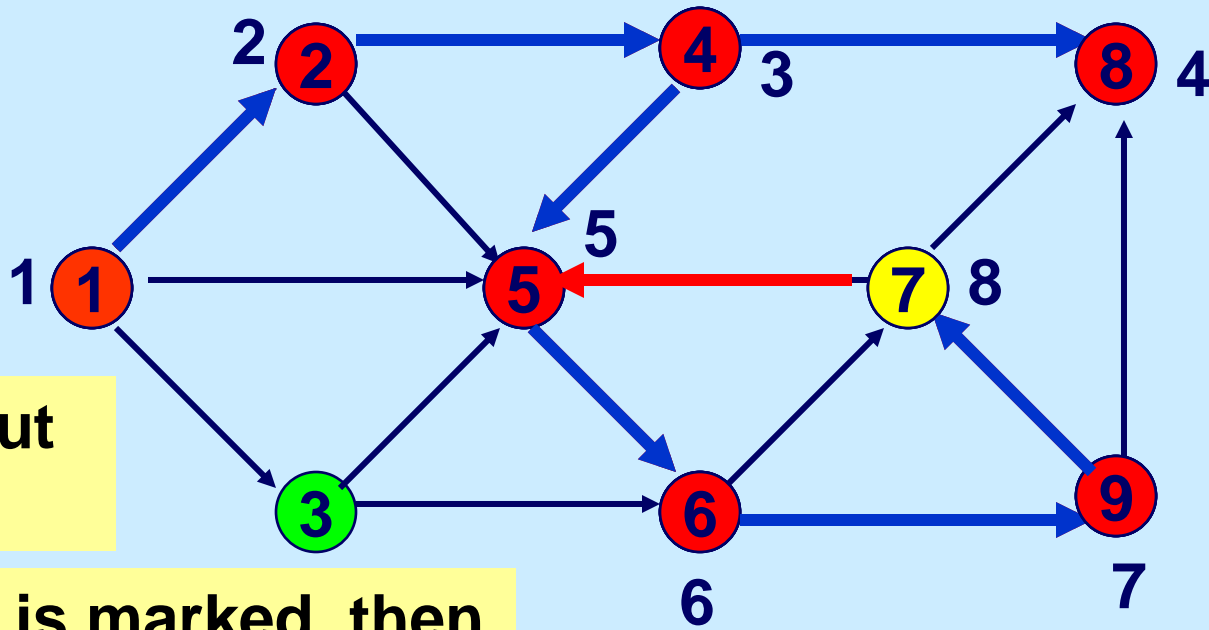
Scan arc out
of node 7

If endpoint is marked, then
label arc as “scanned”.

LIST

1	2	4	5	6	9	7		
---	---	---	---	---	---	---	--	--

Scan arc (7,5)



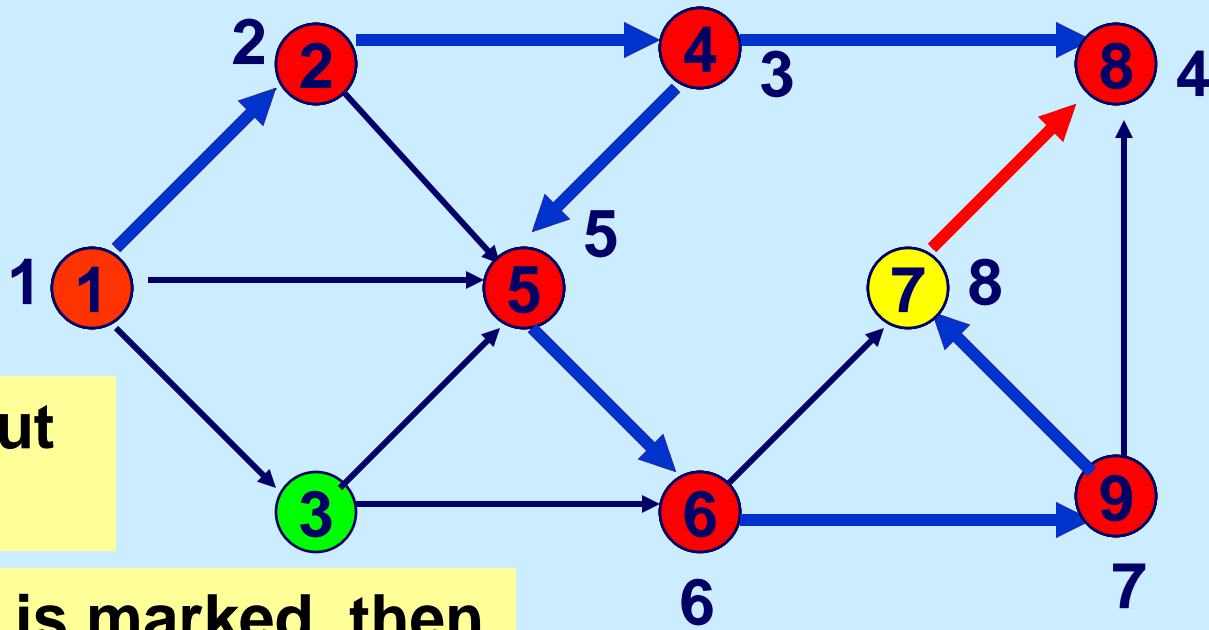
Scan arc out of node 7

If endpoint is marked, then label arc as "scanned".

LIST

1	2	4	5	6	9	7		
---	---	---	---	---	---	---	--	--

Scan arc (7,8)



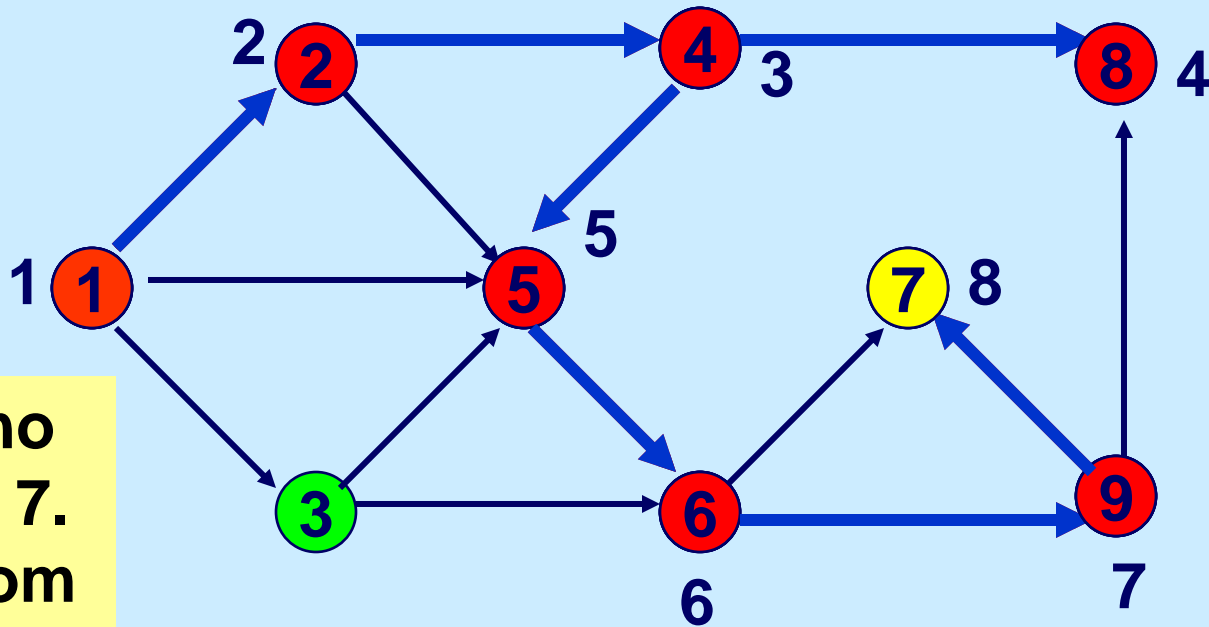
Scan arc out of node 7

If endpoint is marked, then label arc as "scanned".

LIST

1	2	4	5	6	9	7		
---	---	---	---	---	---	---	--	--

If node i is not incident to an admissible arc...

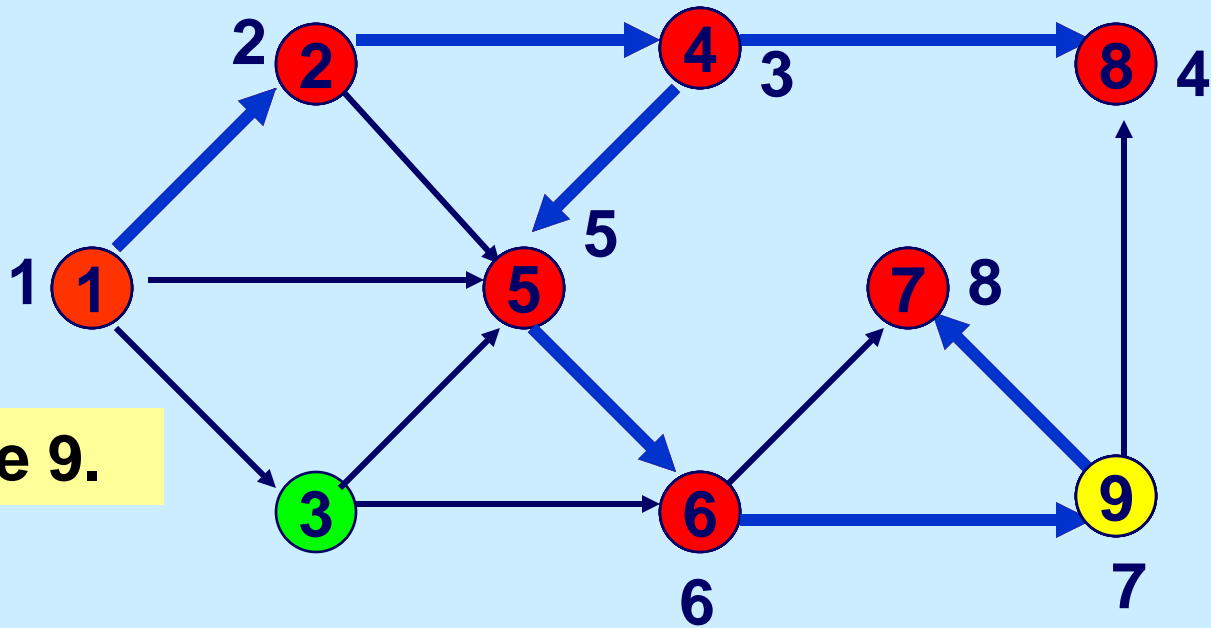


There are no arcs out of 7. Delete 7 from LIST

LIST

1	2	4	5	6	9	7		
---	---	---	---	---	---	---	--	--

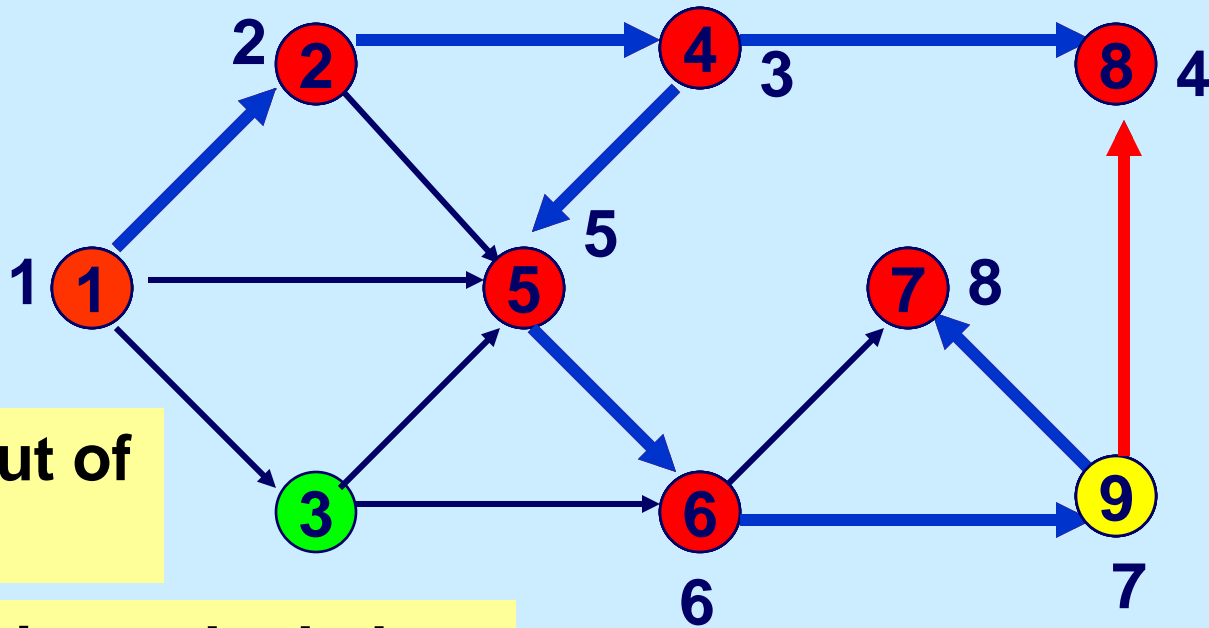
Select node 9



Select node 9.

LIST	1	2	4	5	6	9			
------	---	---	---	---	---	---	--	--	--

Scan (9,4)



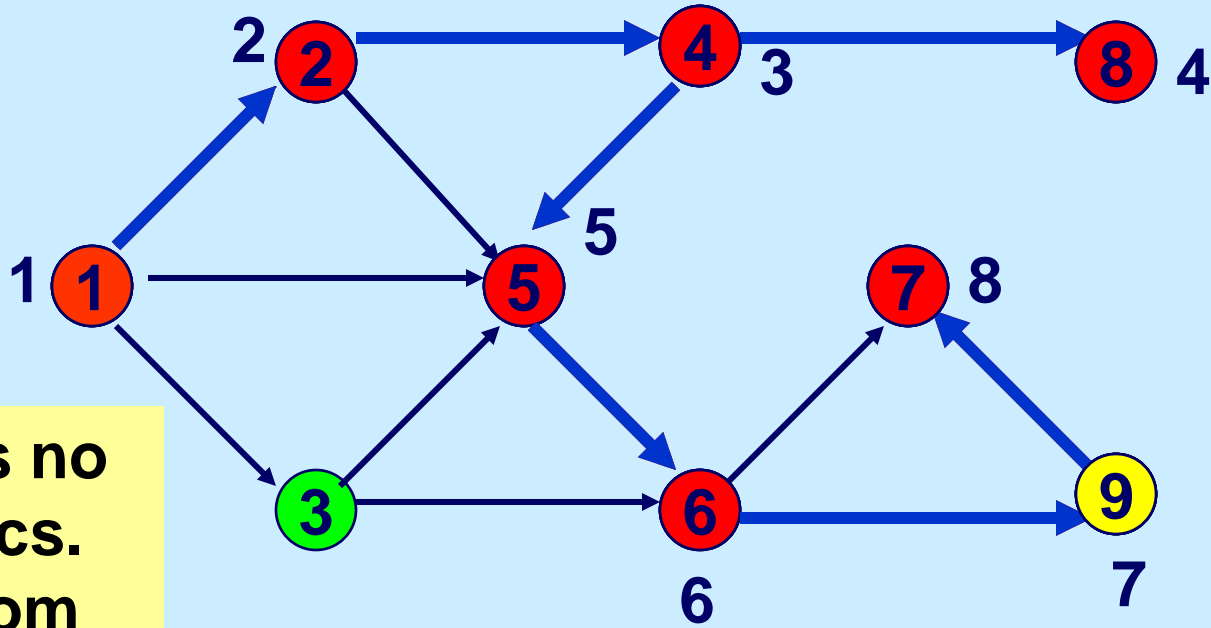
Scan arc out of node 9.

If endpoint is marked, then label arc as "scanned".

LIST

1	2	4	5	6	9			
---	---	---	---	---	---	--	--	--

Delete 9 from LIST

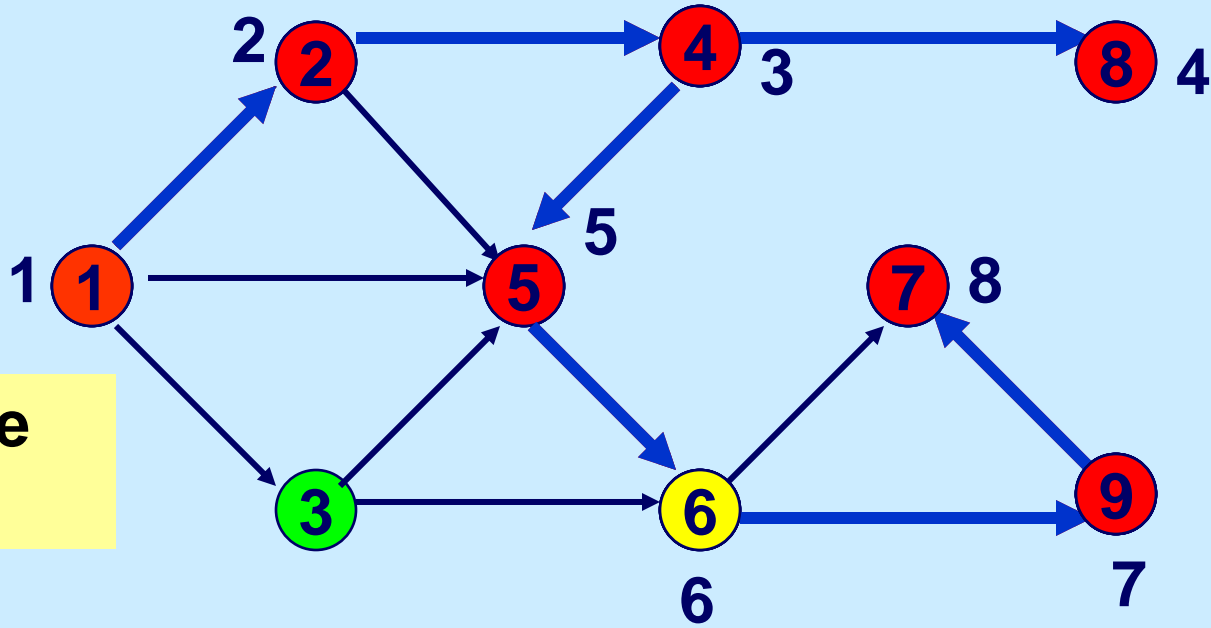


Node 9 has no incident arcs. Delete it from list.

LIST

1	2	4	5	6	9			
---	---	---	---	---	---	--	--	--

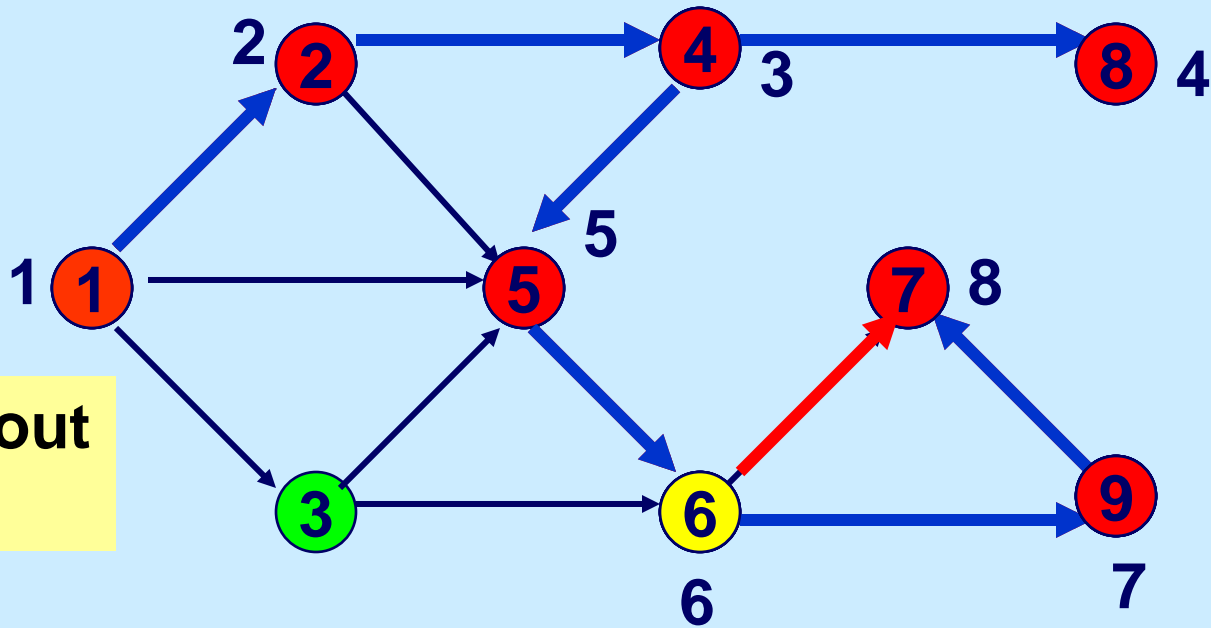
Select node 6



Select node 6.

LIST	1	2	4	5	6				
------	---	---	---	---	---	--	--	--	--

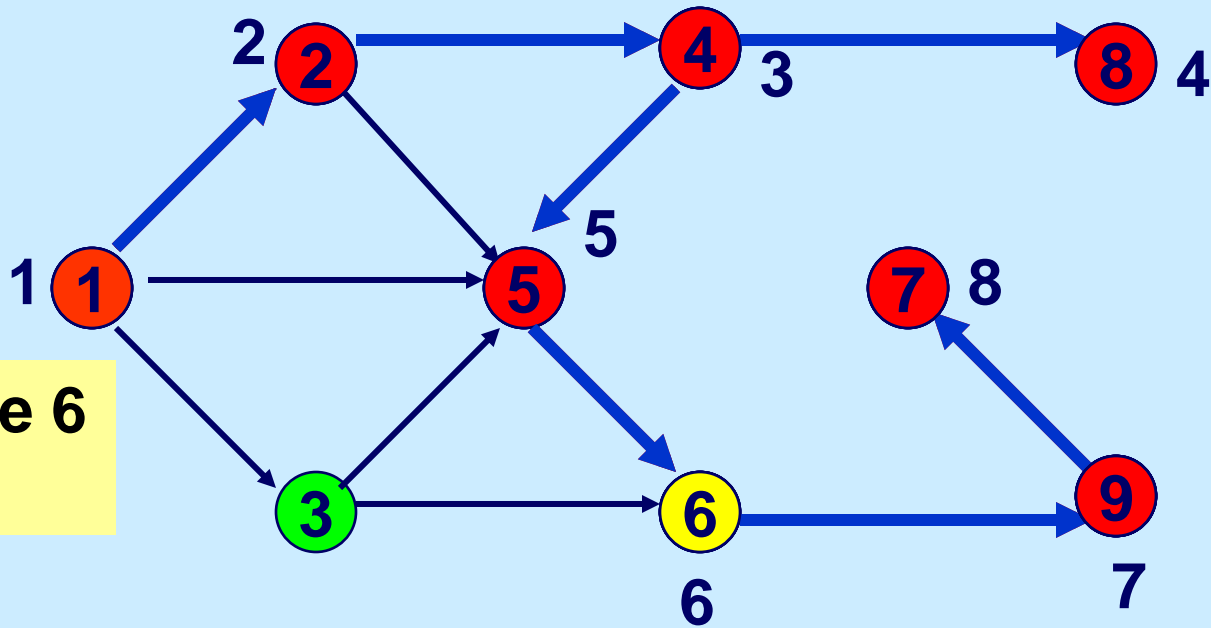
Scan arc (6.7)



Select arc out of node 6.

LIST	1	2	4	5	6				
------	---	---	---	---	---	--	--	--	--

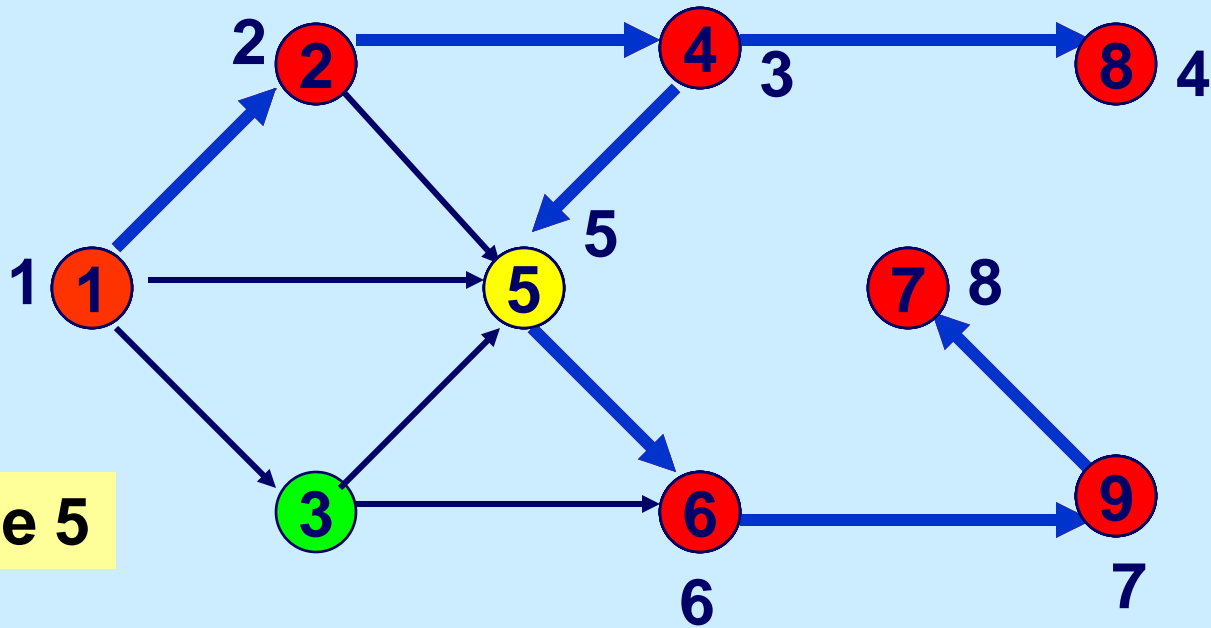
Select node 6



Delete node 6
from LIST

LIST	1	2	4	5	6				
------	---	---	---	---	---	--	--	--	--

Select node 5

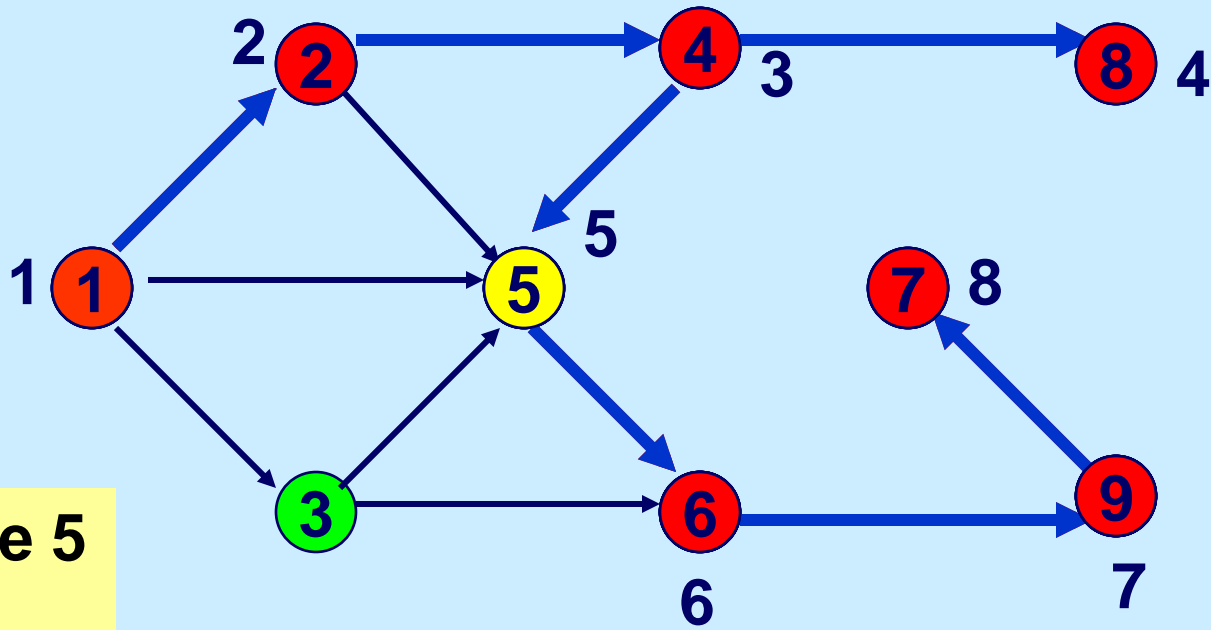


Select Node 5

LIST

1	2	4	5					
---	---	---	---	--	--	--	--	--

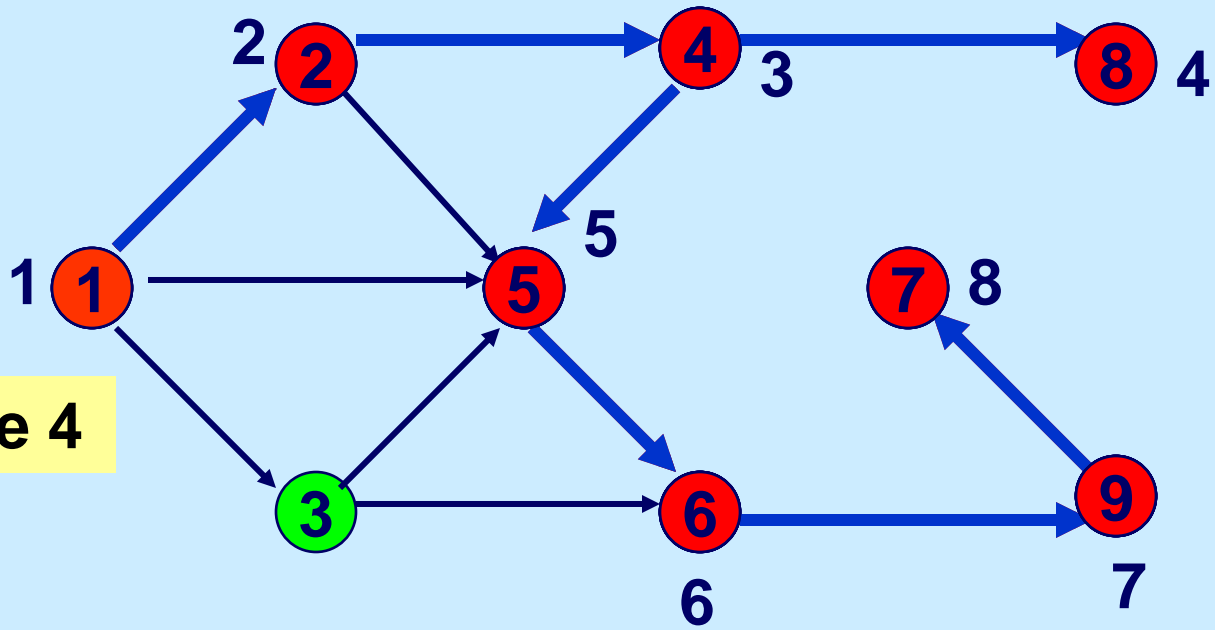
Select node 5



Delete node 5
from LIST



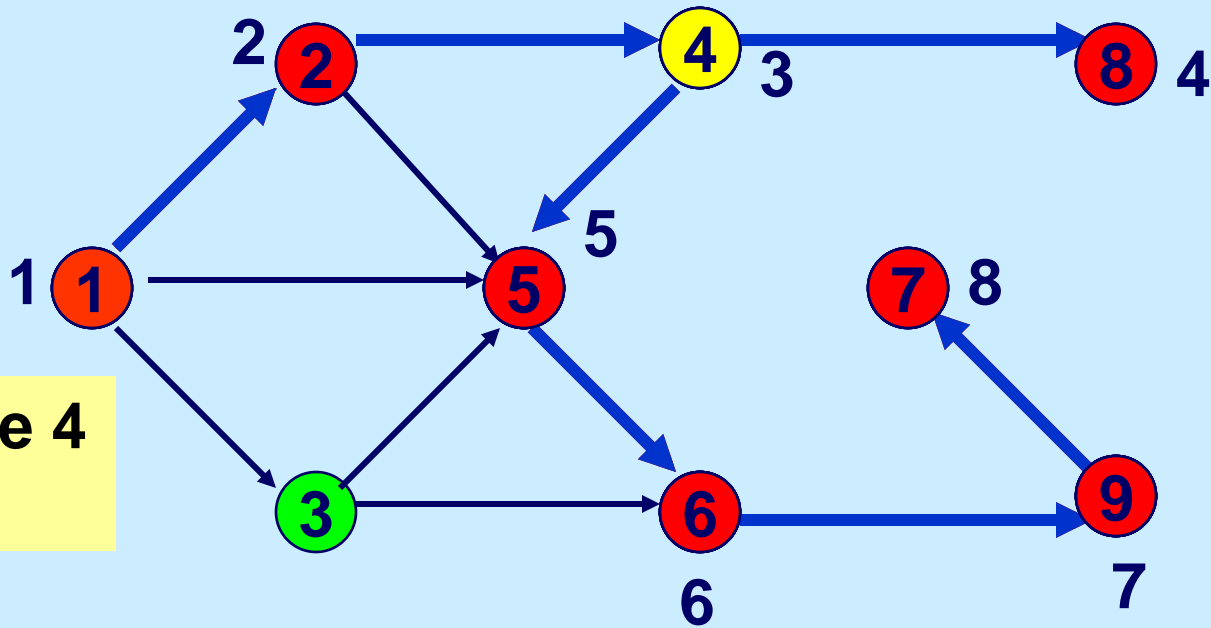
Select node 4



Select node 4

LIST	1	2	4						
------	---	---	---	--	--	--	--	--	--

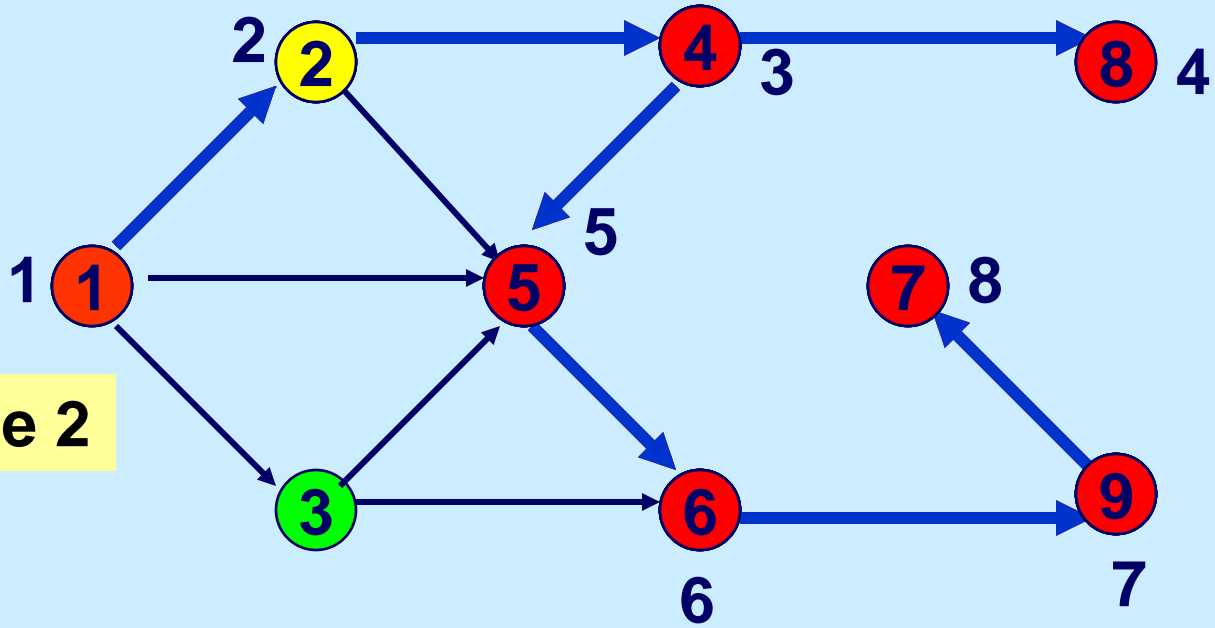
Delete node 4



Delete node 4
from LIST

LIST	1	2	4						
------	---	---	---	--	--	--	--	--	--

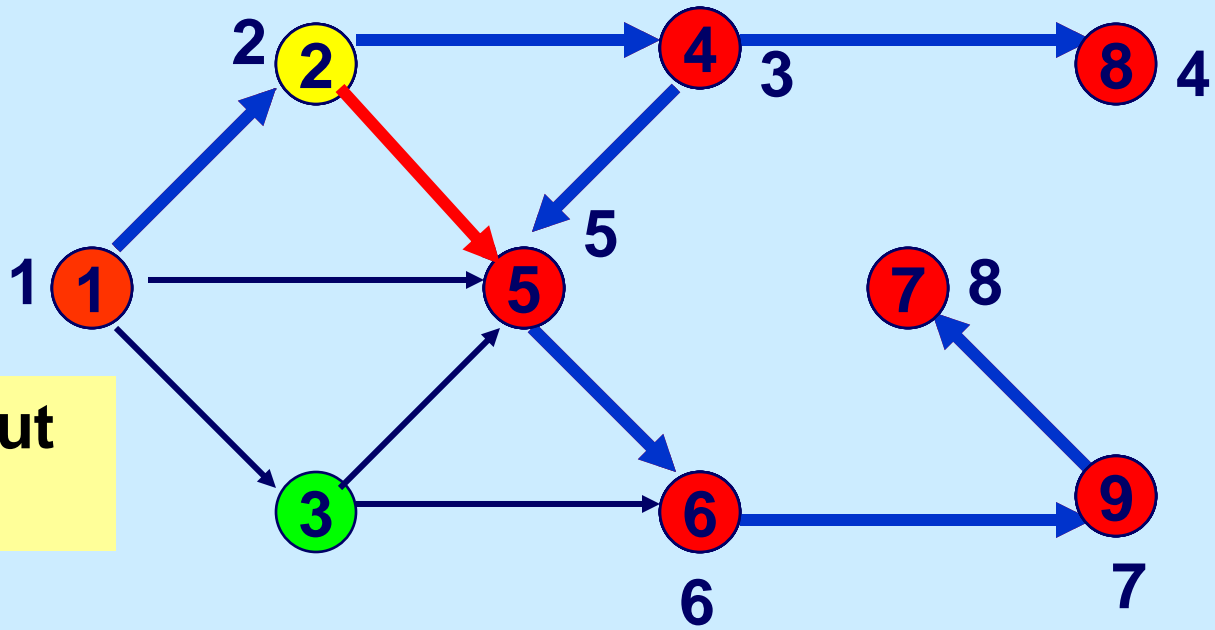
Select node 2



LIST

1	2							
---	---	--	--	--	--	--	--	--

Scan arc (2,5)

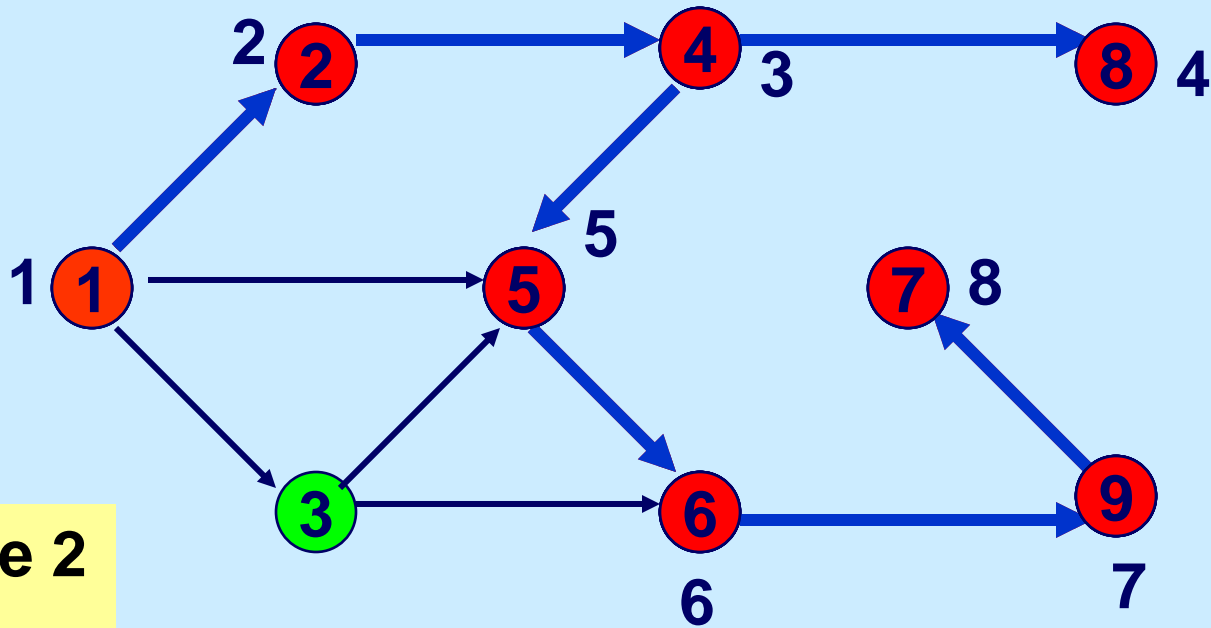


Scan arc out of node 2

LIST

1	2							
---	---	--	--	--	--	--	--	--

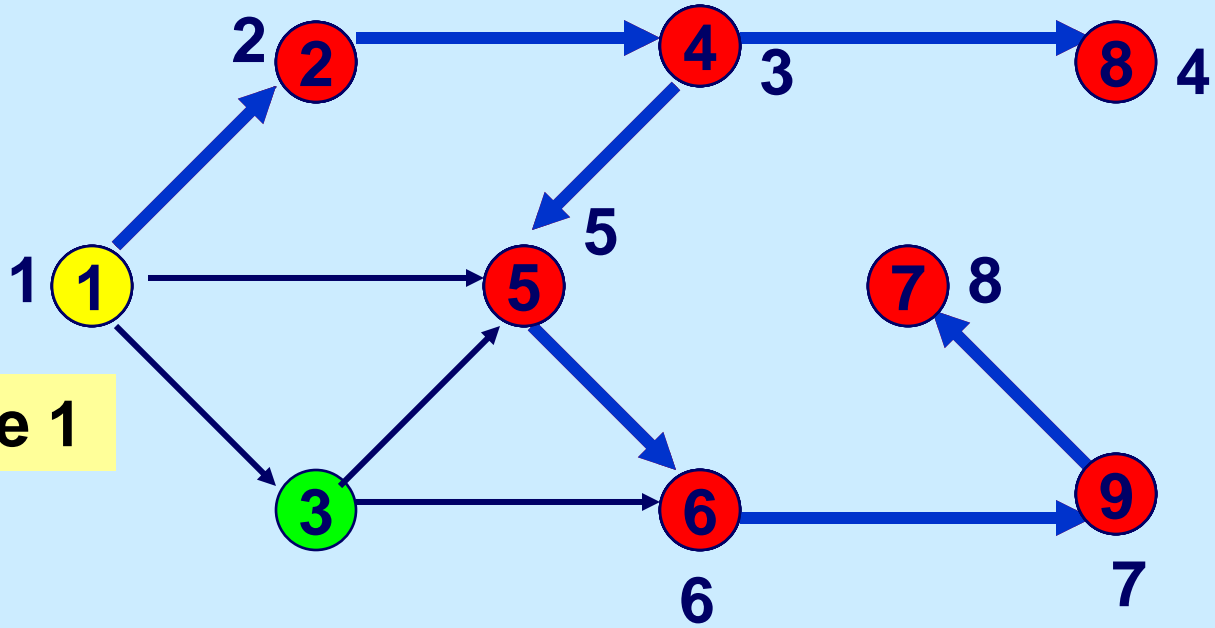
Delete node 2



Delete node 2
from LIST

LIST	1	2							
------	---	---	--	--	--	--	--	--	--

Select node 1

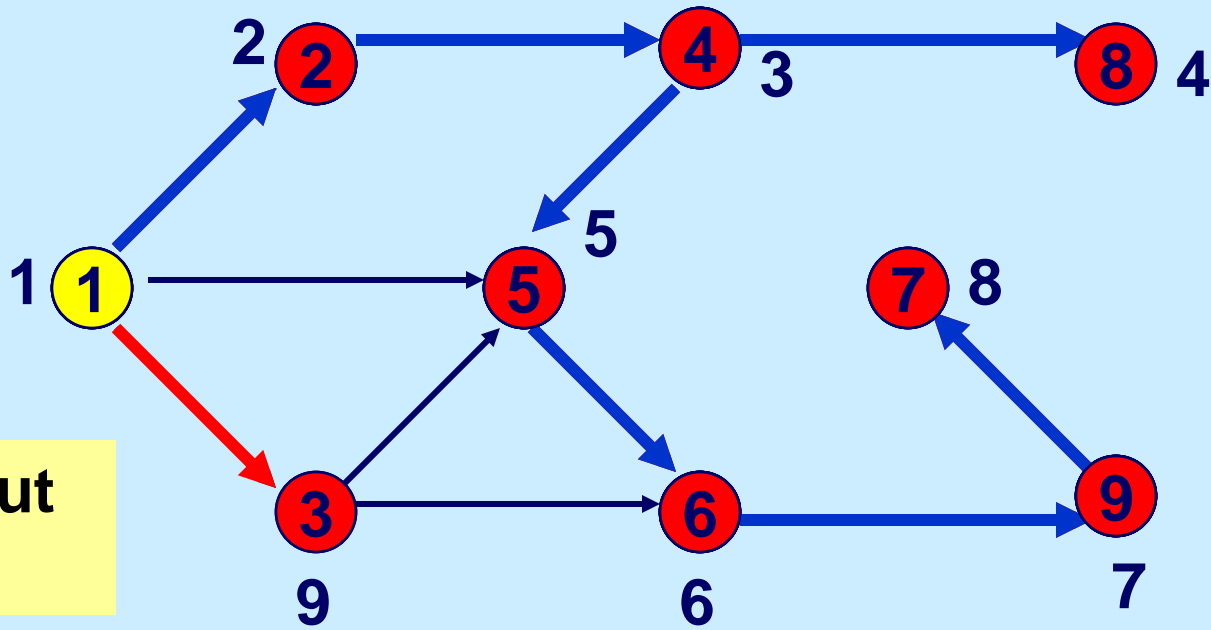


Select node 1

LIST

1									
---	--	--	--	--	--	--	--	--	--

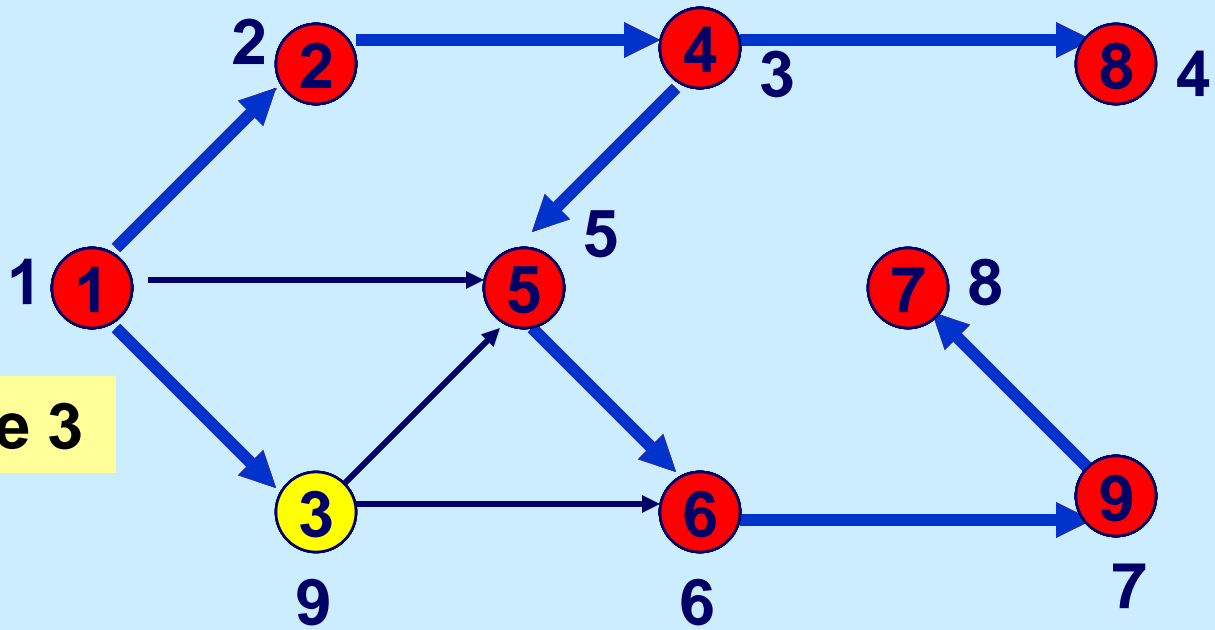
Scan arc (1,3)



LIST

1	3							
---	---	--	--	--	--	--	--	--

Select node 3

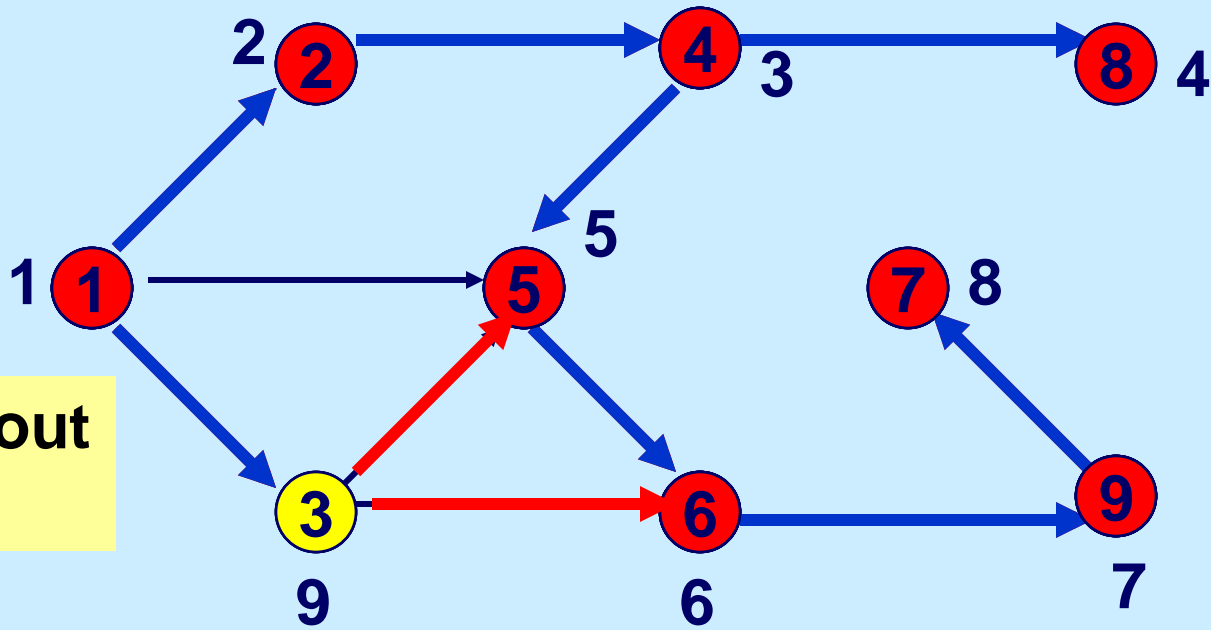


Select node 3

LIST

1	3							
---	---	--	--	--	--	--	--	--

Scan arcs (3,5) and (3,6)

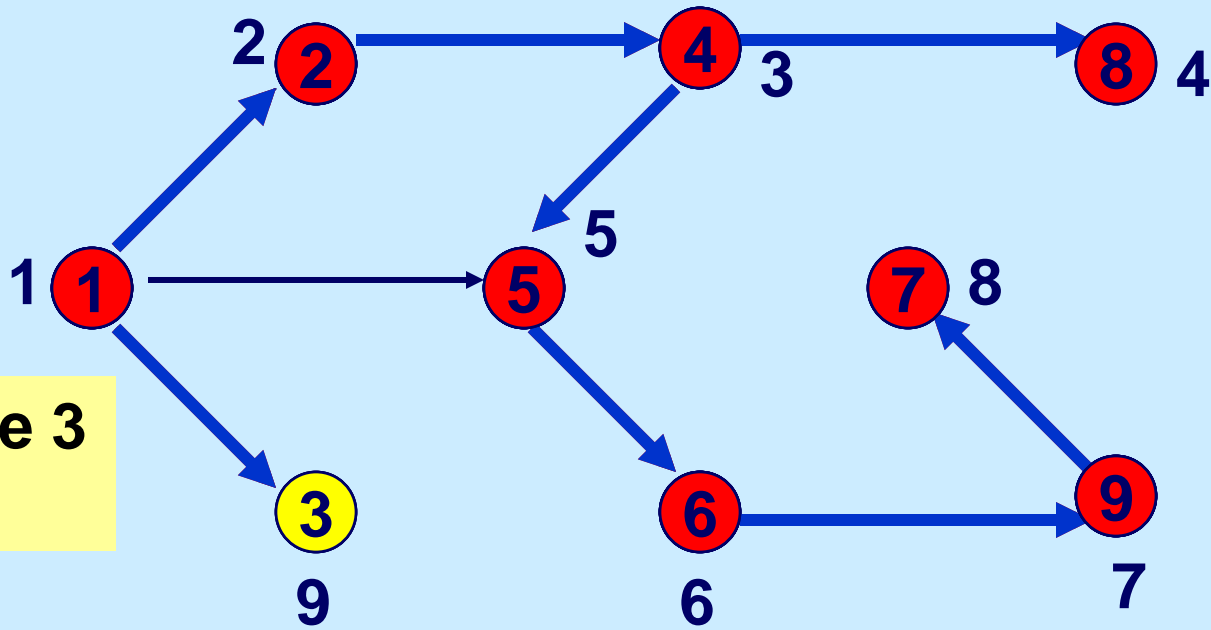


Scan arcs out of node 3

LIST

1	3							
---	---	--	--	--	--	--	--	--

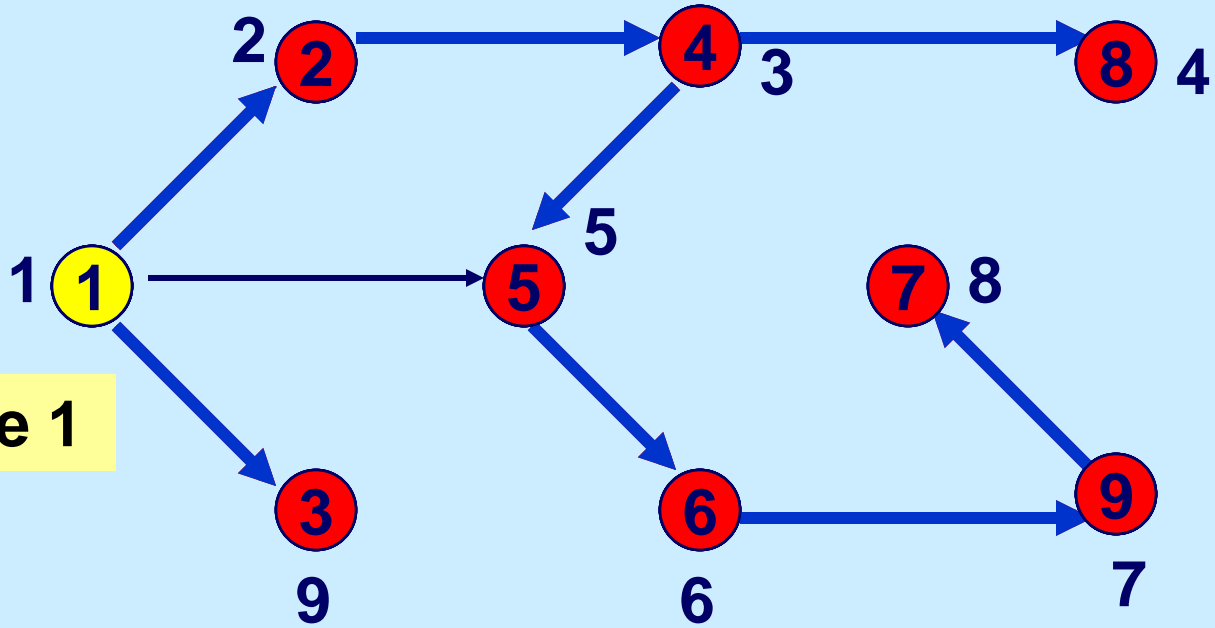
Delete node 3



Delete node 3
from LIST

LIST	1	3							
------	---	---	--	--	--	--	--	--	--

Select node 1

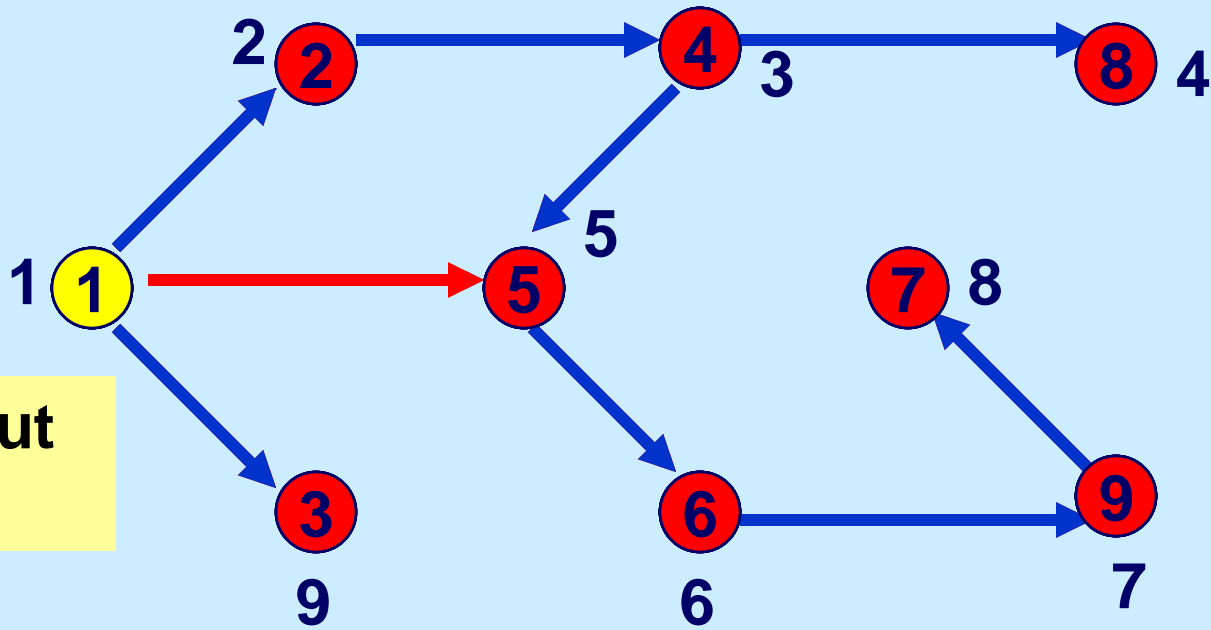


Select node 1

LIST

1									
---	--	--	--	--	--	--	--	--	--

Scan arc (1, 5)

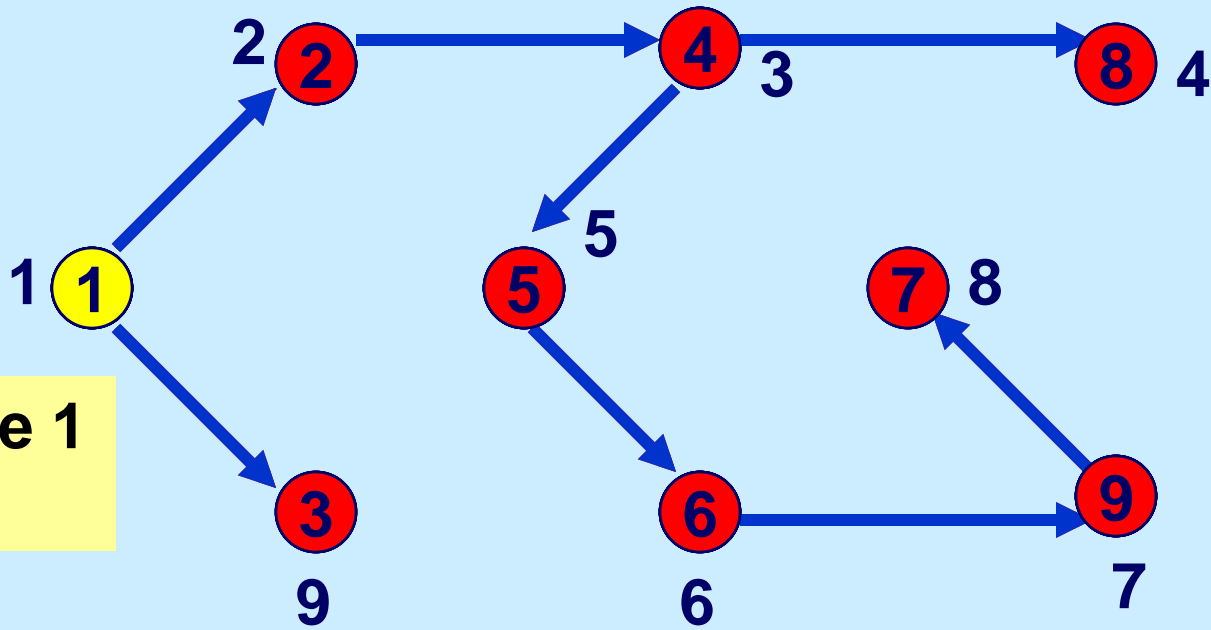


Scan arc out of (1,5)

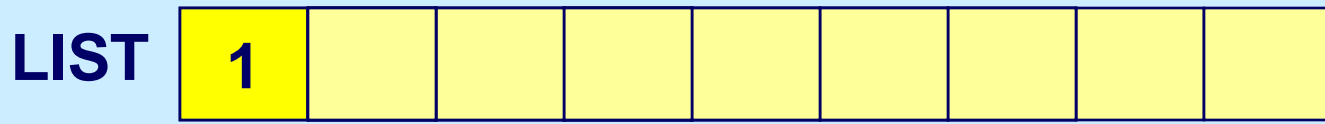
LIST

1								
---	--	--	--	--	--	--	--	--

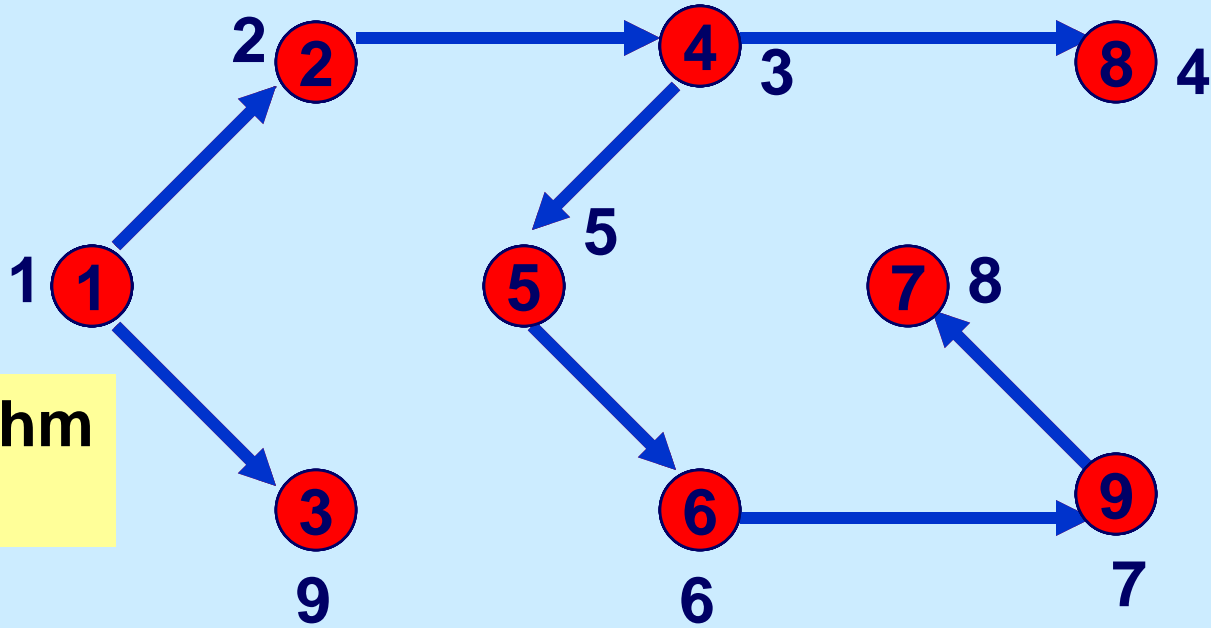
Delete node 1



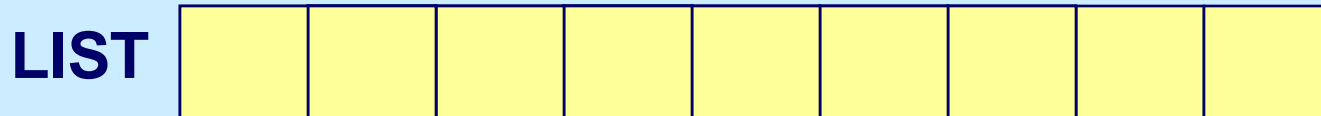
Delete node 1 from LIST



LIST is empty

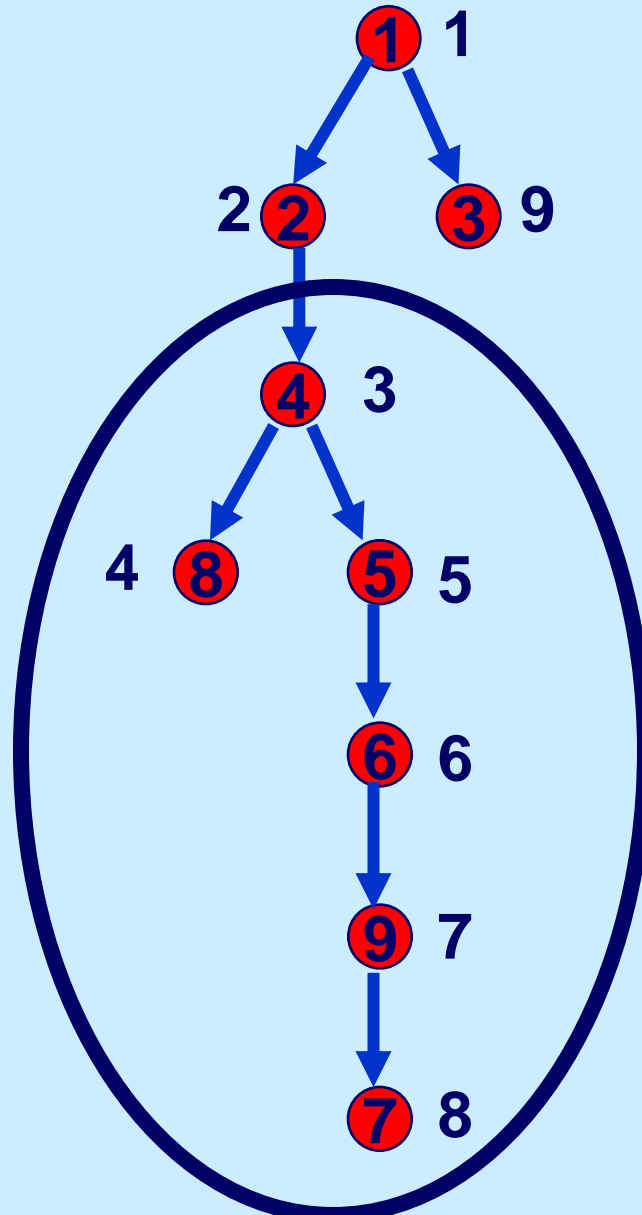


The algorithm ends!



The depth first search tree

Note that each induced subtree has consecutively labeled nodes



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