



# Directed Circuits

Graph theory Lab -- Algorithm, flowchart and example

# Algorithm

Step 1: Start.

Step 2: Read the value of number of vertices( $n$ ) and adjacency matrix.

Step 3: Assign path matrix as 0 and  $k$  and  $as$  1.

Step 4: Assign forbidden matrix  $H$  as 0.

Step 5: Assign value of  $i$  as sum of  $as$  and 1.

Step 6: Check whether  $i$  is greater than  $n$ , if yes go to Step 6.1, otherwise go to Step 7.

Step 6.1: Check whether there exists a directed edge from  $as$  to  $as$ . If yes, print ( $P$ ). Else go to Step 6.2.

Step 6.2: Check value of  $k$  is 1 or not. If yes, go to step 6.2.1, else go to Step 6.3.

Step 6.2.1: Increment value of  $as$  by 1.

Step 6.2.2: Assign  $as$  as  $as$ .

Step 6.2.3: Check whether value of  $as$  is greater than  $n$ . If yes, go to Step 8,

# Algorithm

otherwise, go to Step 4. If value of  $i$  is equal to  $n$ , go to Step 6.

Step 6.3: Clear the list of forbidden vertices from  $L$ .

Step 6.4: Make the path from  $u$  to  $v$  as forbidden.

Step 6.5: Assign  $k$  as 0 and decrement values of  $k$  by 1 and go to Step 5.

Step 7: Check whether there is a directed edge from  $u$  to  $i$ . If yes, go to Step 7.1, Otherwise go to Step 7.3.

Step 7.1: Check whether value ' $i$ ' is in the path matrix. If yes, go to Step 7.3, otherwise, Step 7.2.

Step 7.2: Check whether vertex  $i$  is forbidden from vertex  $u$ , if yes go to Step 7.3, otherwise go to Step 7.2.1.

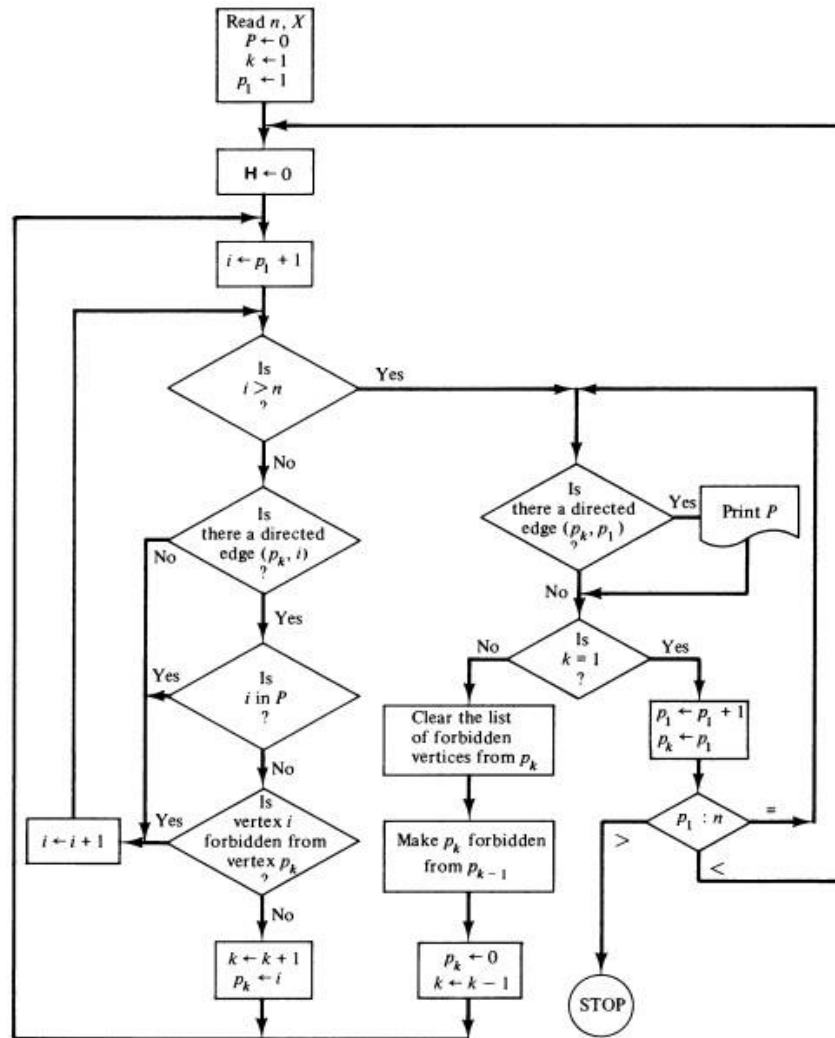
Step 7.2.1: Increment value of  $k$  by one.

Step 7.2.2: Assign value of  $i$  as  $u$  and go to Step 5.

Step 7.3: Increment value of  $i$  by 1 and go to Step 6.

Step 8: Stop.

# Flow chart



# Example

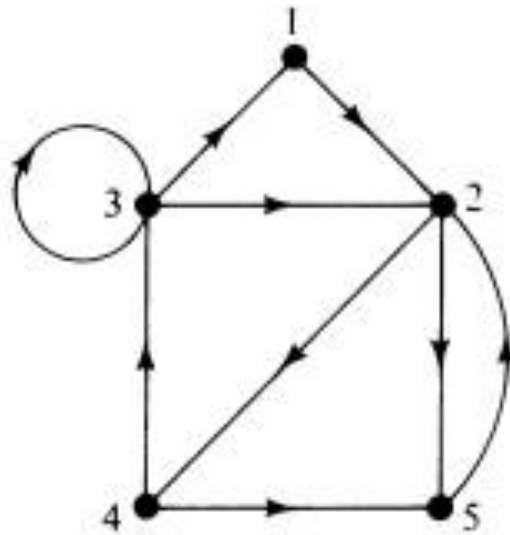


Fig. 11-6 Digraph.

# Solution

P1	P2	P3	P4	P5
1	0	0	0	0
1	2	0	0	0
1	2	4	0	0
1	2	4	3	0
1	2	4	0	0
1	2	4	5	0
1	2	4	0	0
1	2	0	0	0
1	2	5	0	0
1	2	0	0	0
1	0	0	0	0

DIRECTED CIRCUITS

P1 P2 P3 P4 P5

2 0 0 0 0

2 4 0 0 0

2 4 3 0 0 DIRECTED CIRCUITS

2 4 0 0 0

2 4 5 0 0 DIRECTED CIRCUITS

2 4 0 0 0

2 0 0 0 0

2 5 0 0 0 DIRECTED CIRCUITS

2 0 0 0 0

P1 P2 P3 P4 P5

3 0 0 0 0 DIRECTED CIRCUITS

P1 P2 P3 P4 P5

4 0 0 0 0

4 5 0 0 0

4 0 0 0 0

P1 P2 P3 P4 P5

5 0 0 0 0



THANK YOU !