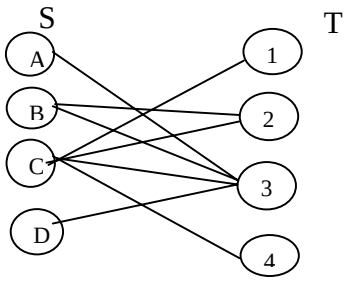
BIPARTITE MAXIMUM CARDINALITY MATCHING ALGORITHM

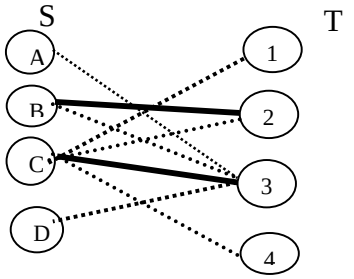
Problem: obtain maximum cardinality matching in a bipartite graph.

1 Make initial assignments
2 Label all exposed vertices by Ø (empty vertex).
3 Find an augmenting path starting from empty vertices
4 Augment the selected path.
5 Continue step 1-2-3 until no augmenting path remain.

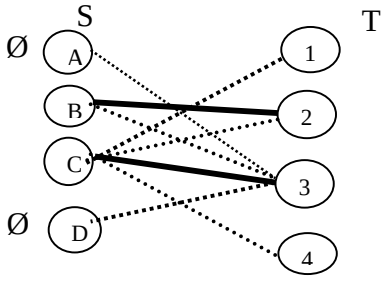
Example: Obtain maximum cardinality matching in the following graph.



Step 1. Initial assignments (arbitrary)



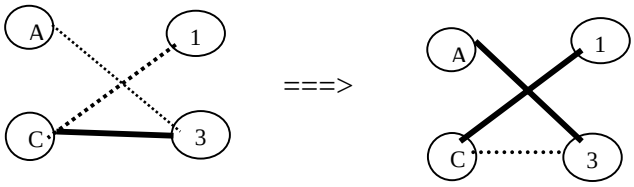
Step 2 Label exposed vertices



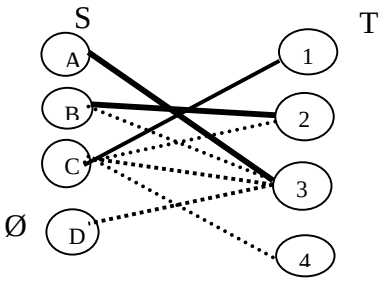
Step 3 Find Augmenting paths and select one.

P1: A-3-C-1
P2: A-3-C-4
P3: D-3-C-1
P4: D-3-C-4

Step 4 Augment P1



The new Figure is



CYCLE 2

Find new Augmenting Paths
Possible augmenting path must start from D.
P1: D-3-A (is not augmenting)
No augmenting path exist. ===> STOP
This is maximum cardinality matching