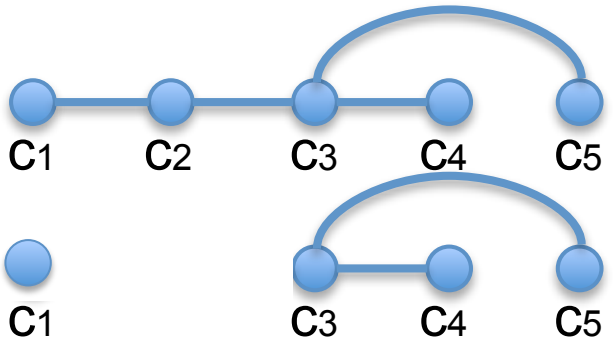
Conflict Graphs

- Corresponding to each column i with value 1, we have a node.
- Columns i and j conflict, iff there is an edge (i,j).

C1	C2	C3	C4	C5
1	1	1	1	1
1	0	1	1	1
0	1	0	1	1
0	0	0	0	1
0	0	1	0	0
0	0	0	1	1
0	0	0	0	0



Errata

Theorem 4. *Given a simple graph G with n vertices and m edges, there exists a binary matrix M with n columns and $2m+1$ rows, such that all entries of its first row are equal to 1 and $\mathcal{G}_{M,1} = G$.*

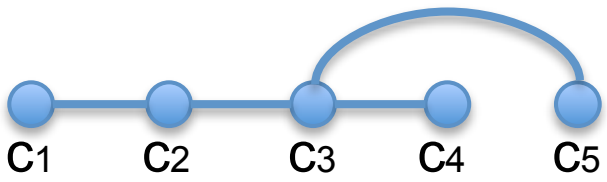
- In our setting for tumor phylogeny, the conflict graph **cannot** be any arbitrary graph and this will affect some of our results.

Characterizing conflict graphs

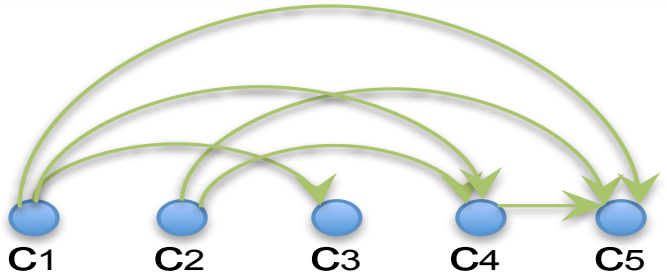
Let M be a mutation matrix with an all-zeros row and an all-ones row:

For a given row r, let G(r) be its conflict graph for a row r.

Lemma: The complement of G(r) (i.e. the containment graph) is a partial order



G(r) is a conflict graph

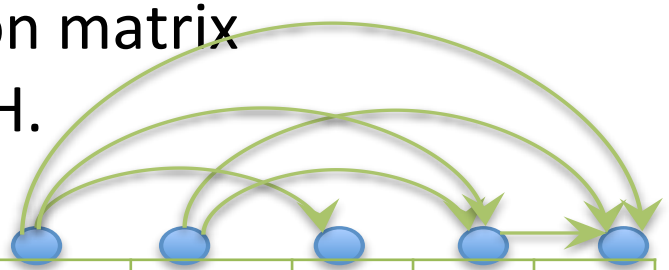


Complement of G(r): a containment graph

Characterizing conflict graphs

Remark: For any graph *H* whose complement is a containment graph, there is a mutation matrix with an all-ones row r such that G(r)=H.

C1	C2	C3	C4	C5
1	1	1	1	1
1	0	0	0	0
0	1	0	0	0
0	0	1	0	0
0	0	0	1	0
0	0	0	0	1
0	0	0	0	0



C1	C2	C3	C4	C5
1	1	1	1	1
1	0	1	1	1
0	1	0	1	1
0	0	1	0	0
0	0	0	1	1
0	0	0	0	1
0	0	0	0	0