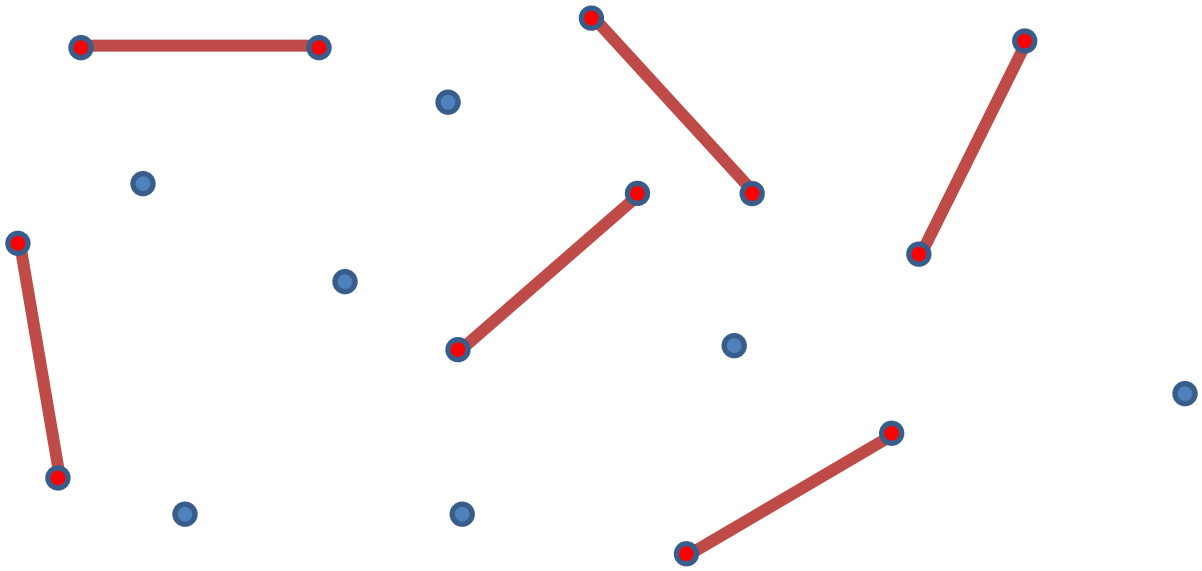
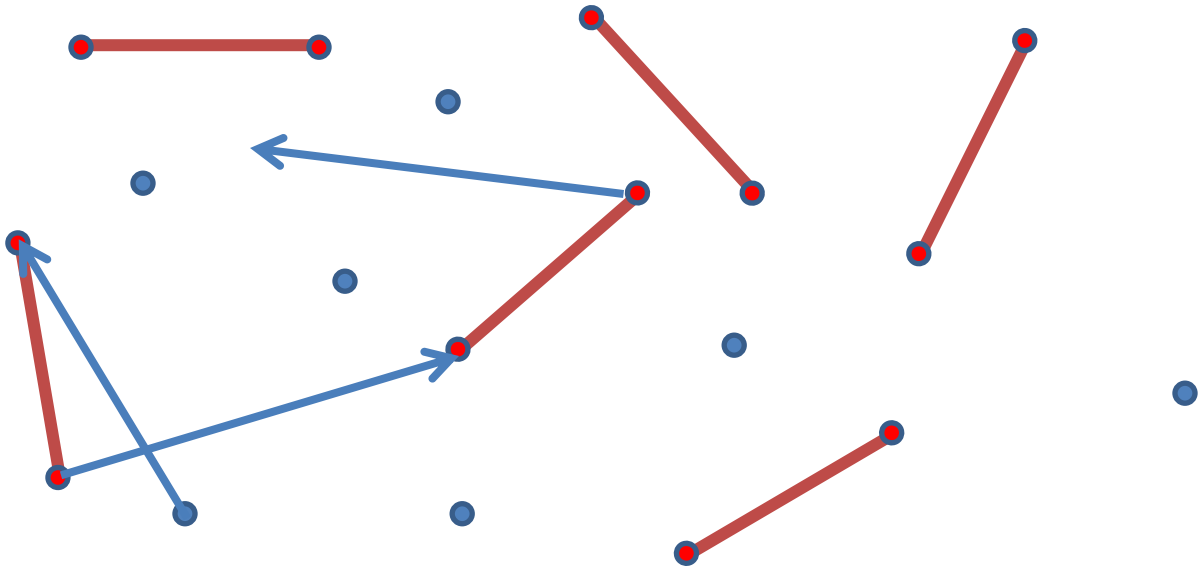
Let G be a bipartite graph and **M** a maximal matching.

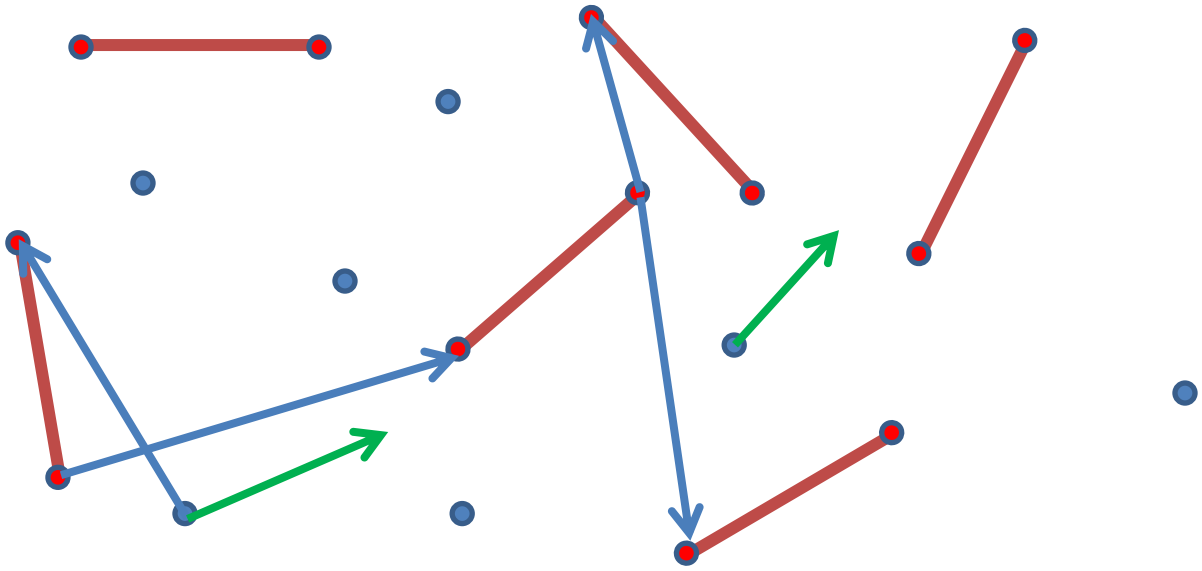
- Are covered (saturated) vertices
- Are un-saturated vertices.



This bipartite graph has 17 vertices and a maximal matching of size 6. All other edges are not visible. We wish to show that it has a vertex cover of size 6. How do we find the 6 vertices?



1. The “blue” vertices form an independent set. Why?
2. We shall start unmasking edges connecting blue vertices to covered vertices by arrows.
3. Where can the blue edge go next?
4. Where will the alternating blue-red path end?



7. The last blue edge will end in a covered vertex.
8. Where can the green edges go?
9. Because G is bipartite and because M is a maximum matching every red edge will have exactly one “entry” (end of a blue arrow) vertex.