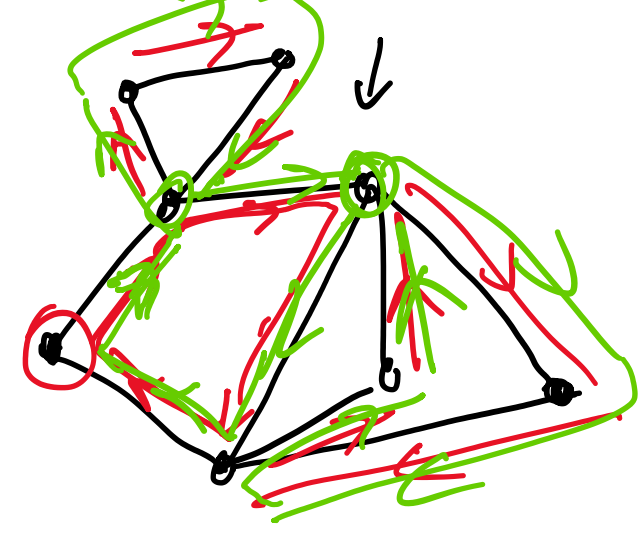
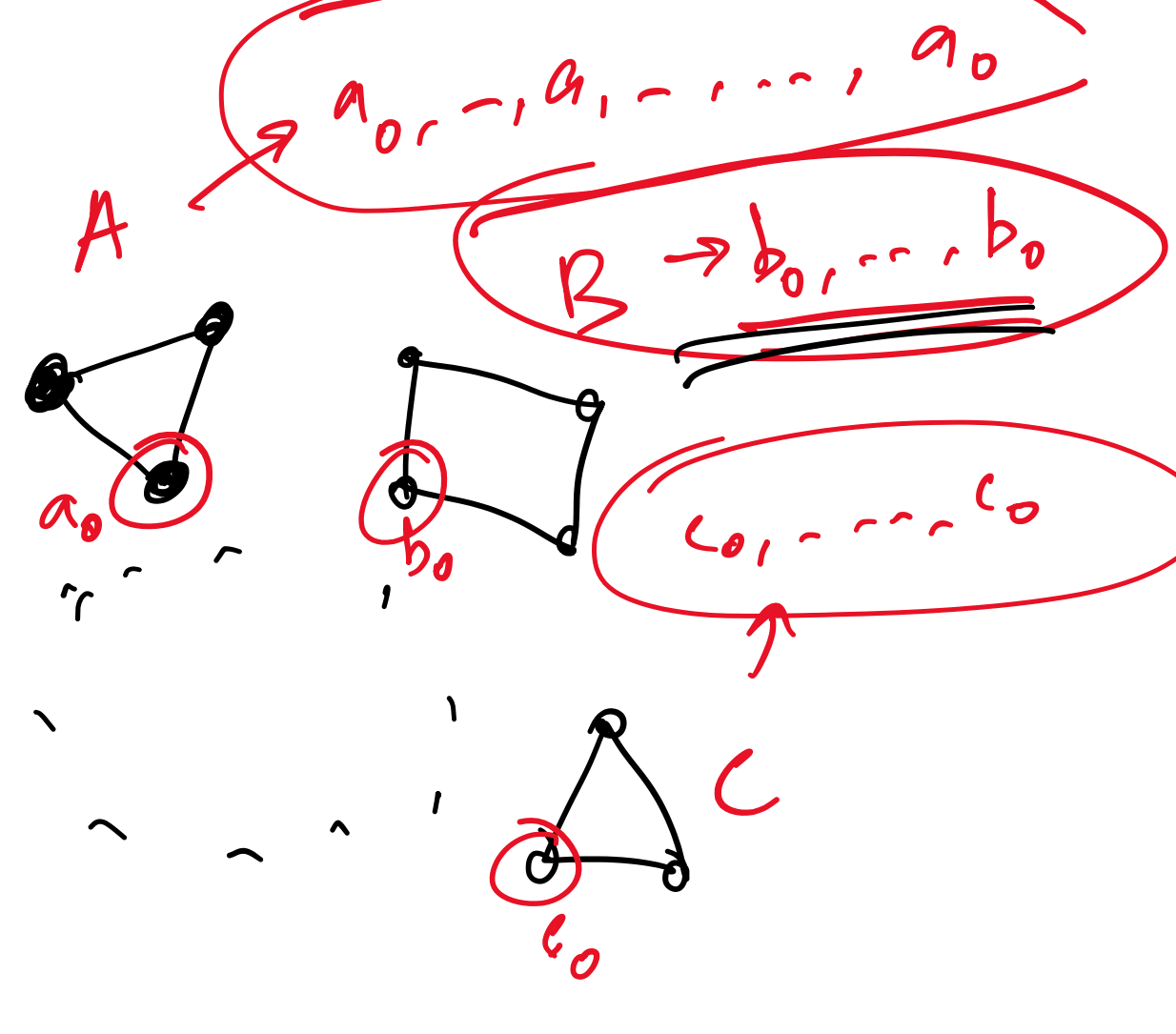
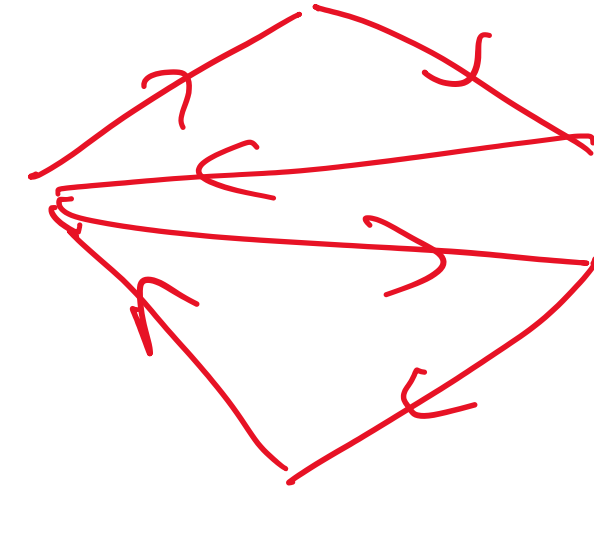


If every vertex has even degree and graph is connected then graph has an Euler tour.



$v_0, \dots, v_1, \dots, v_0$

G_1



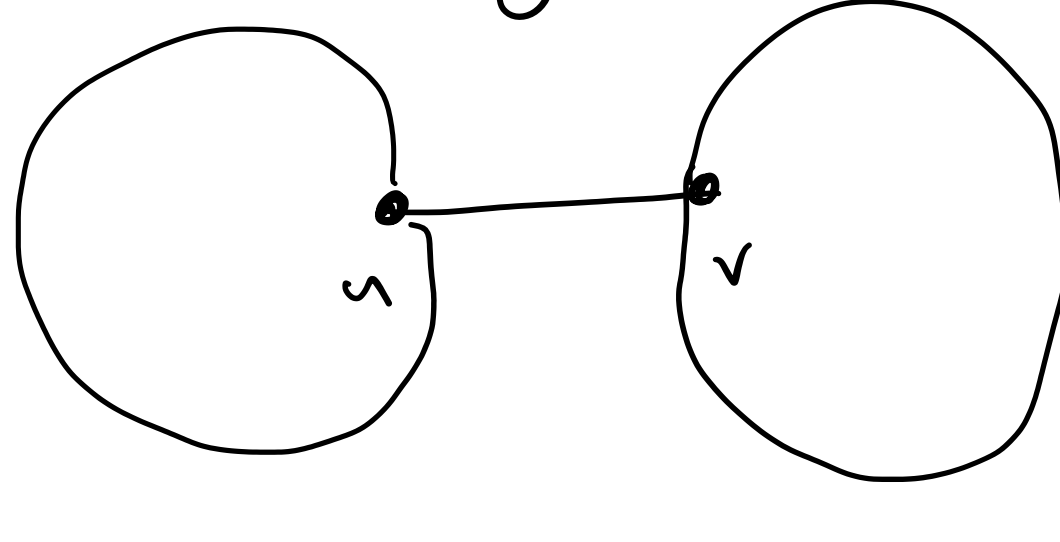
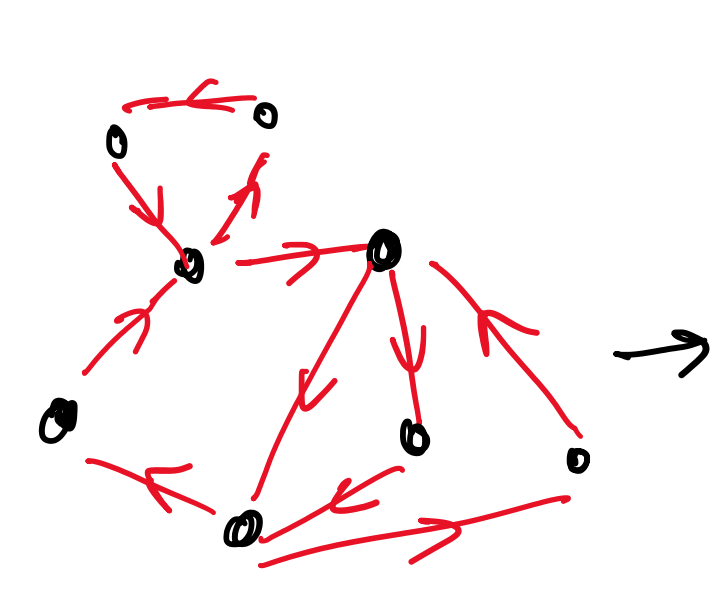
$v_0, \dots, b_0, \dots, a_0, \dots, v_0$

$v_0, \dots, b_0, \dots, b_0, \dots, a_0, \dots, a_0, \dots, v_0$

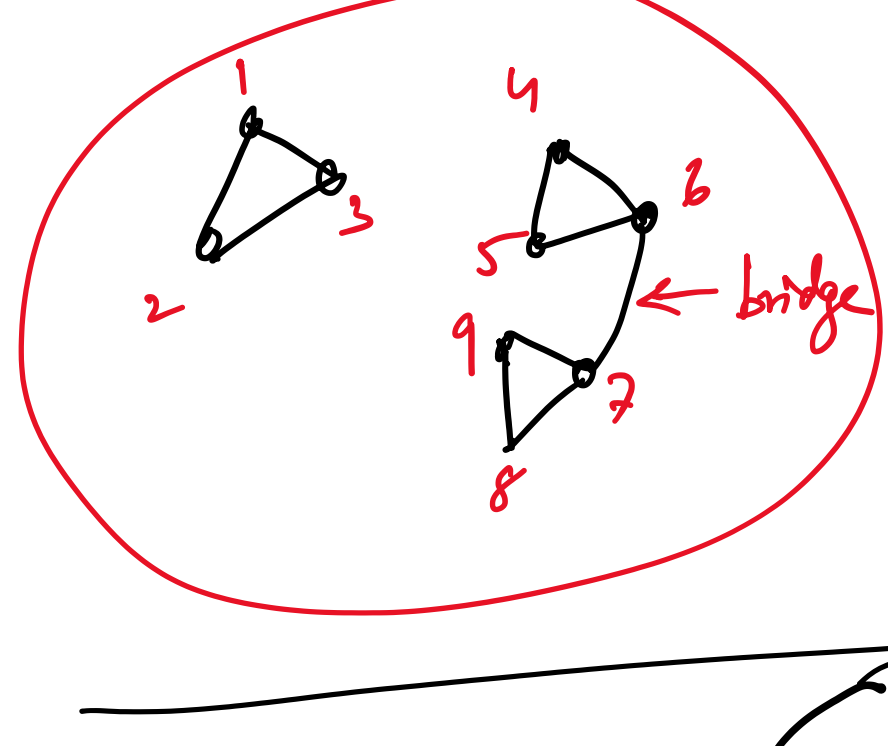
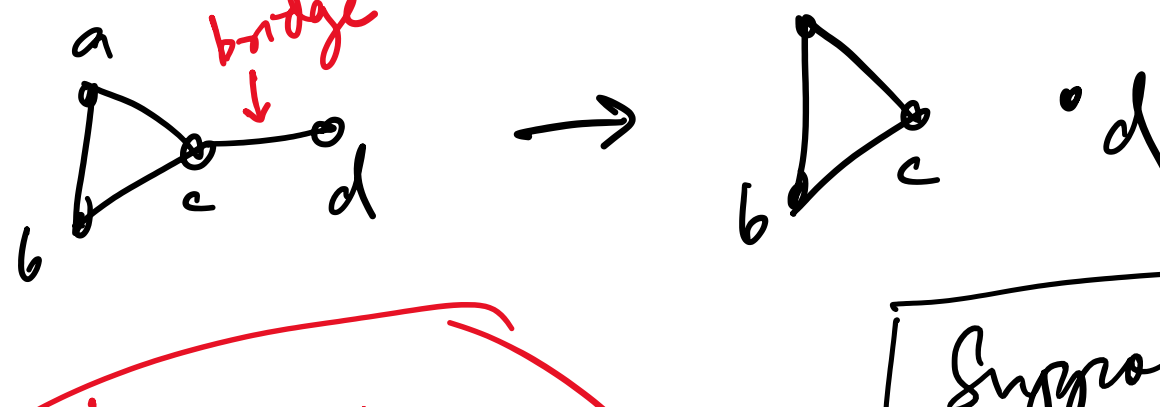
Hierholzer's algorithm

Fleury's algorithm

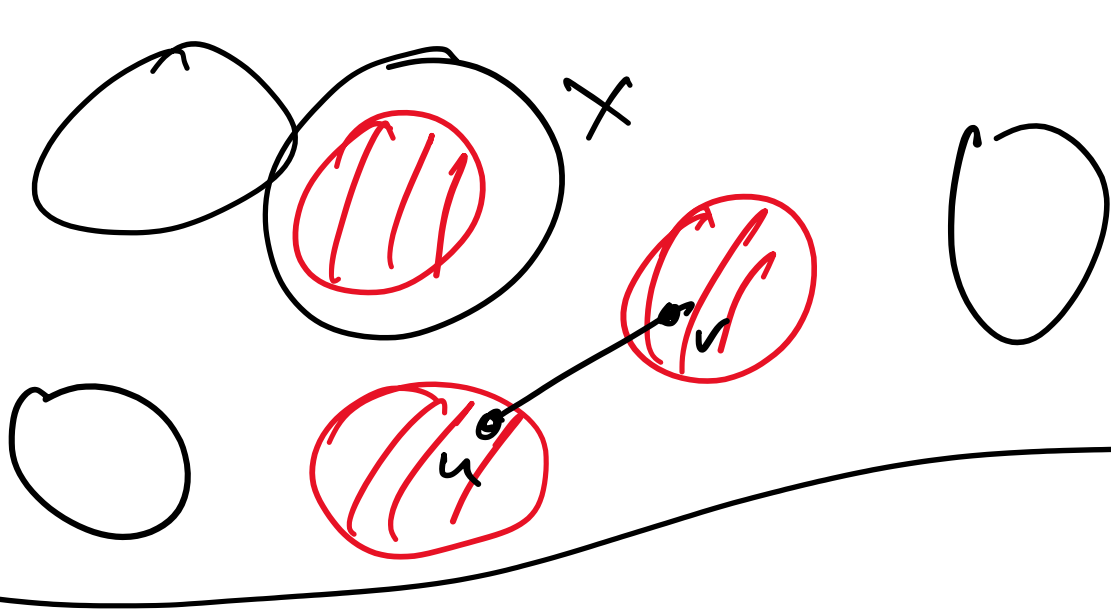
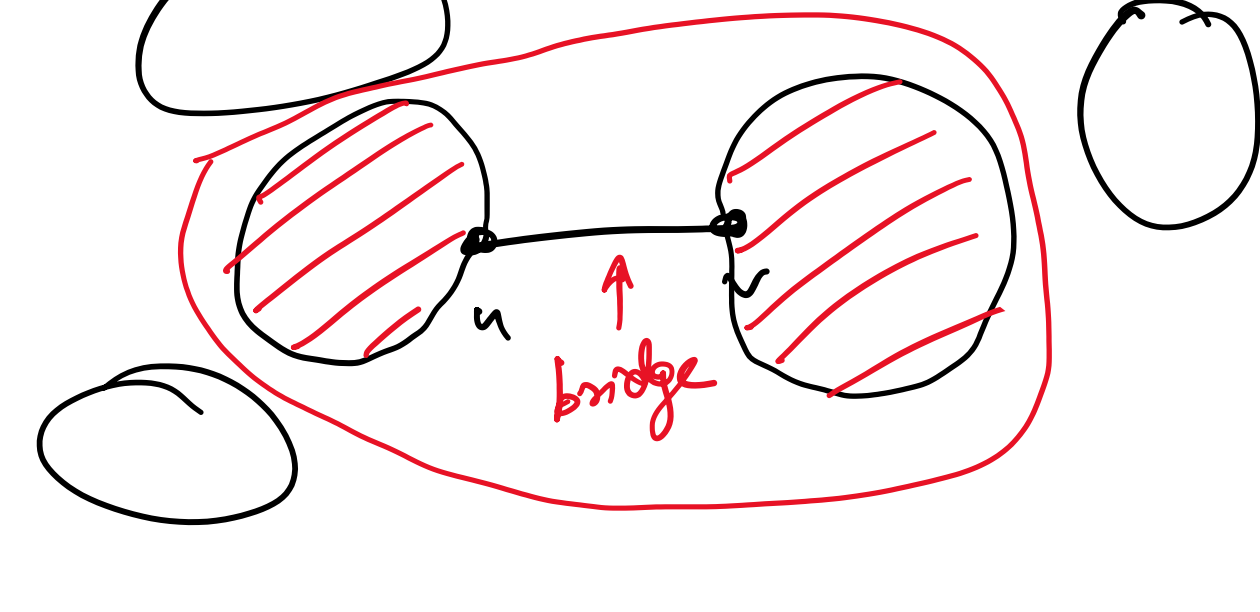
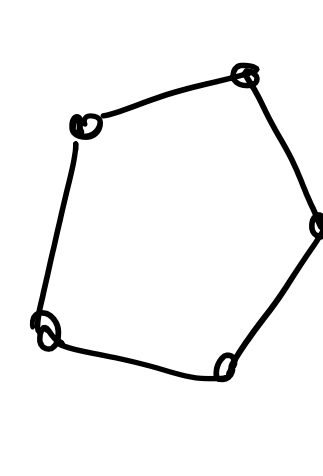
"bridge"



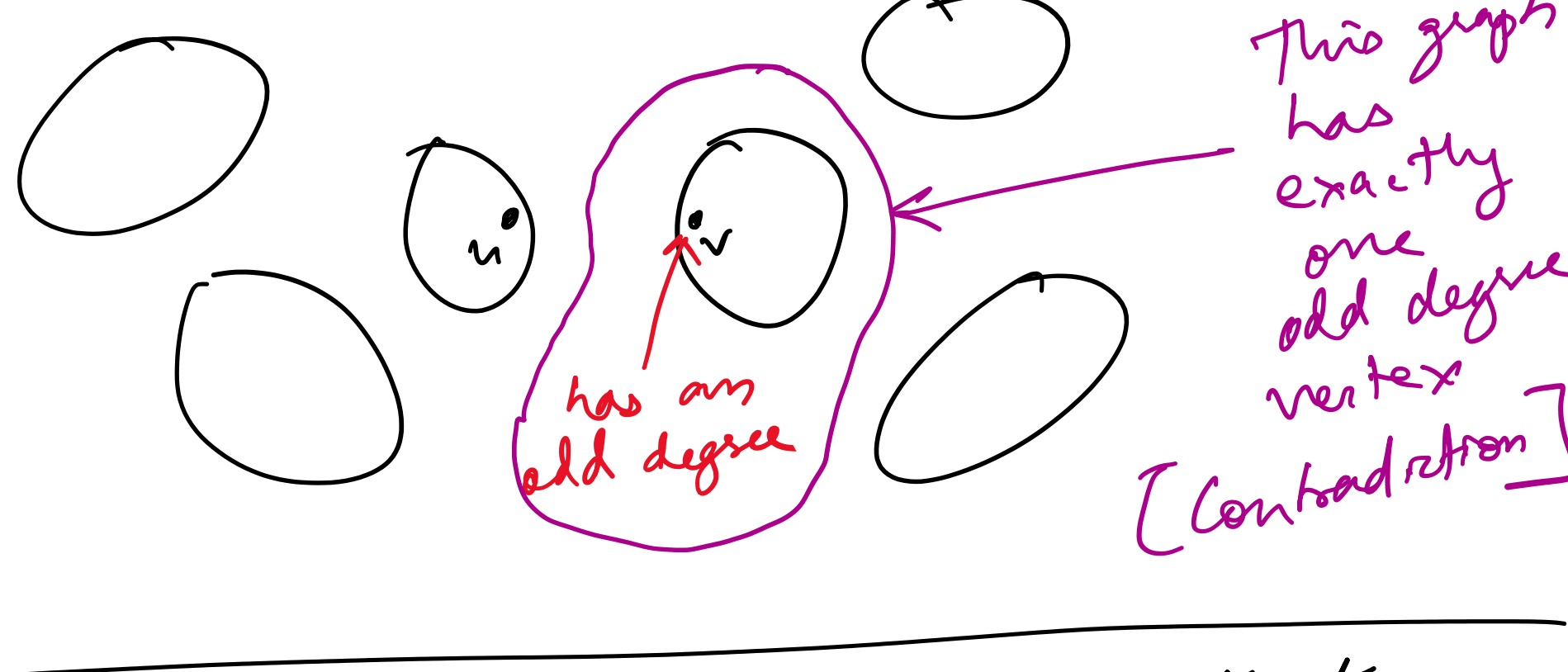
A bridge is an edge whose removal increases the no. of connected components



Suppose every vertex in G has an even degree. Can G contain a bridge? No.



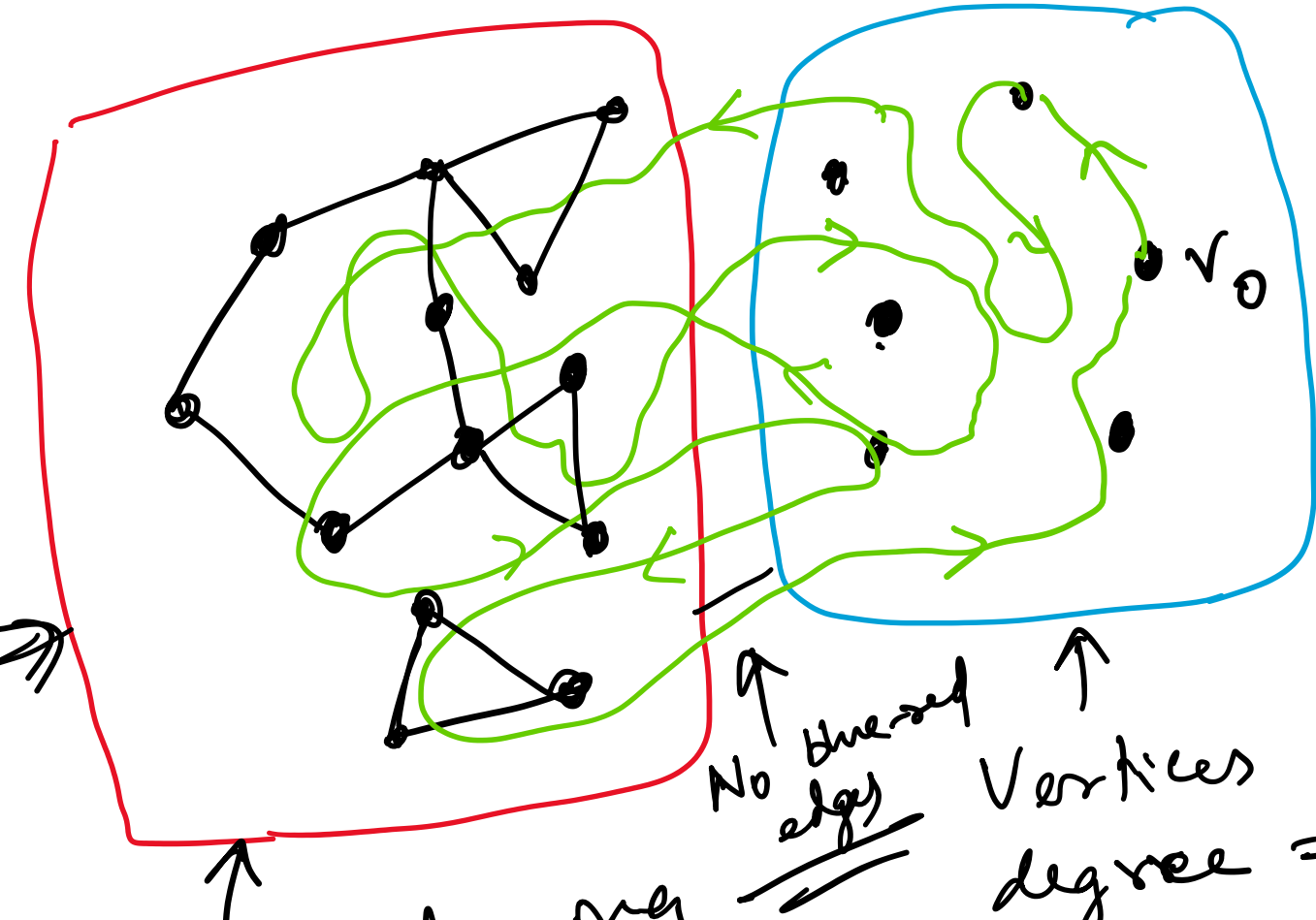
Suppose every vertex has an even degree.



This graph has exactly one odd degree vertex [Contradiction]

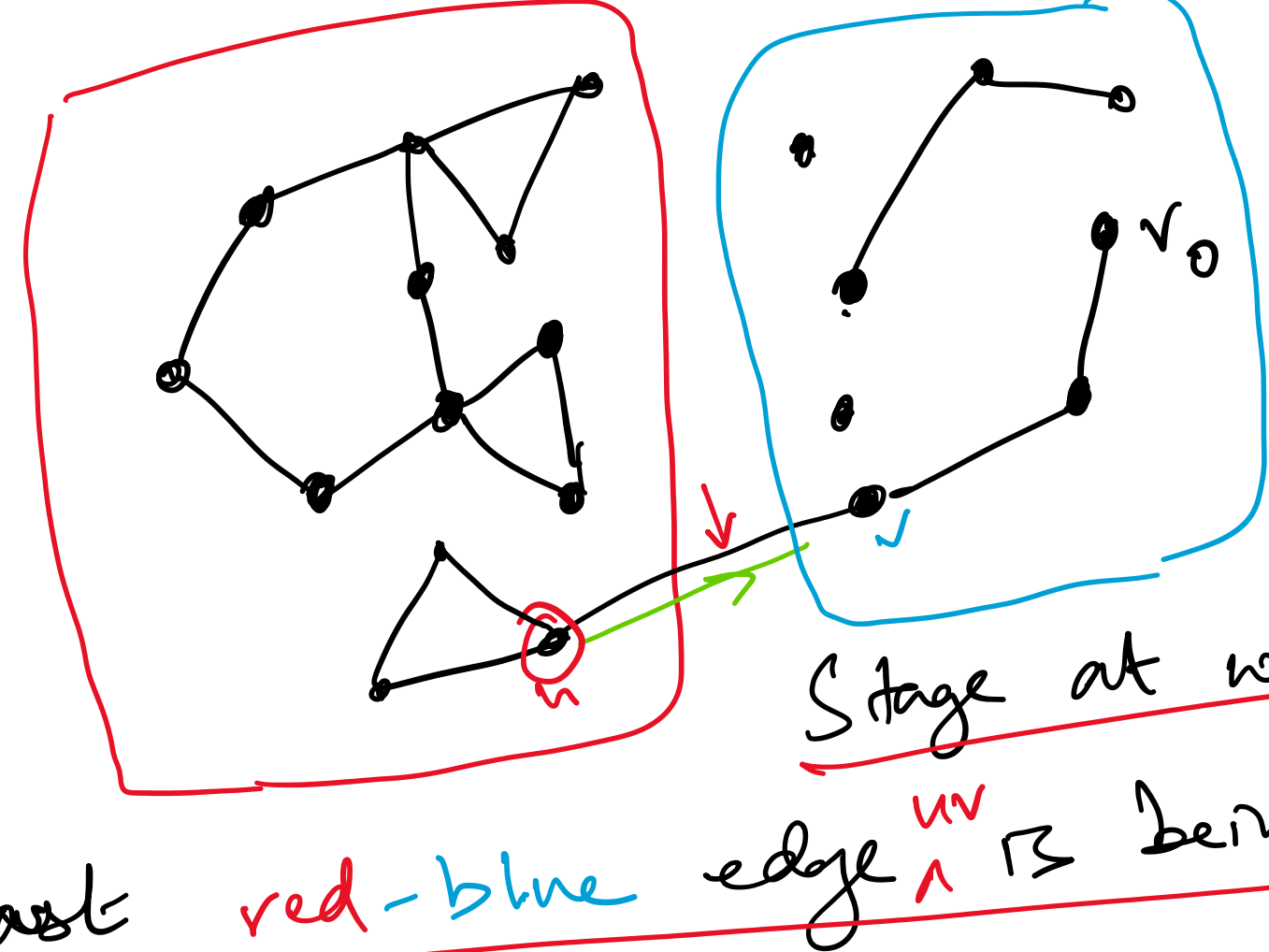
Suppose for the sake of contradiction that Fleury's algorithm does not produce an Euler tour.

Then algorithm produced a tour that did not contain all the edges.

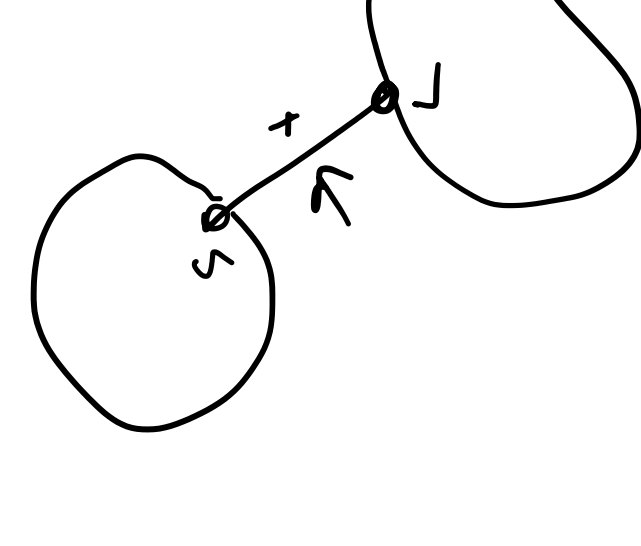
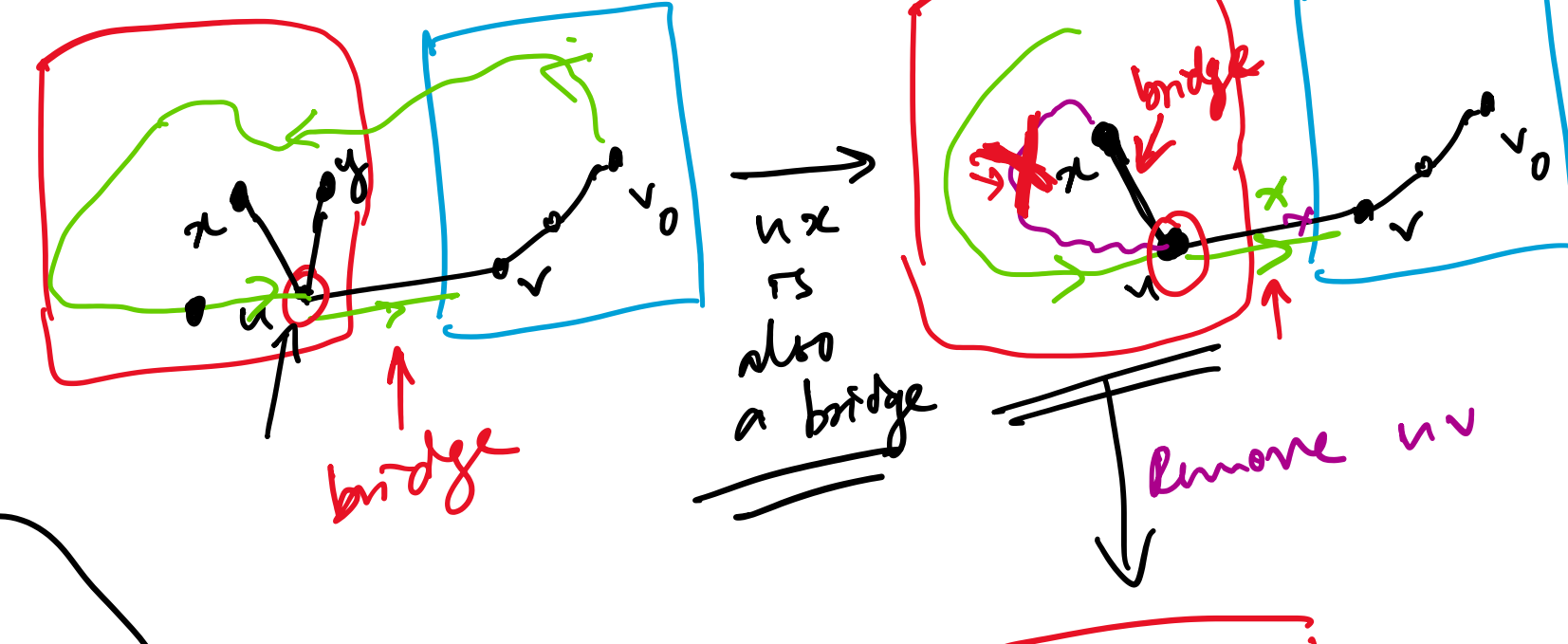


Final stage
 $\text{degree}(v_0) = 0$
 otherwise algo. wouldn't have stopped.

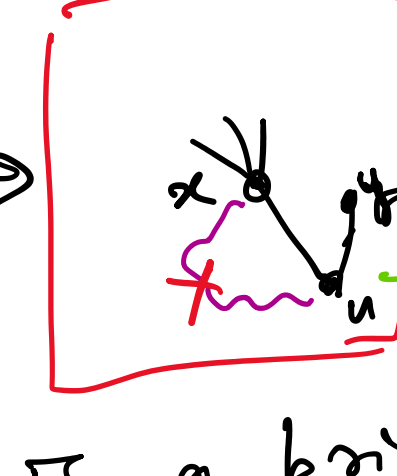
Vertices having degree = 0 in the end.



Last red-blue edge uv is being chosen.



Every vertex has even degree



uv is a bridge in this graph [Contradiction]