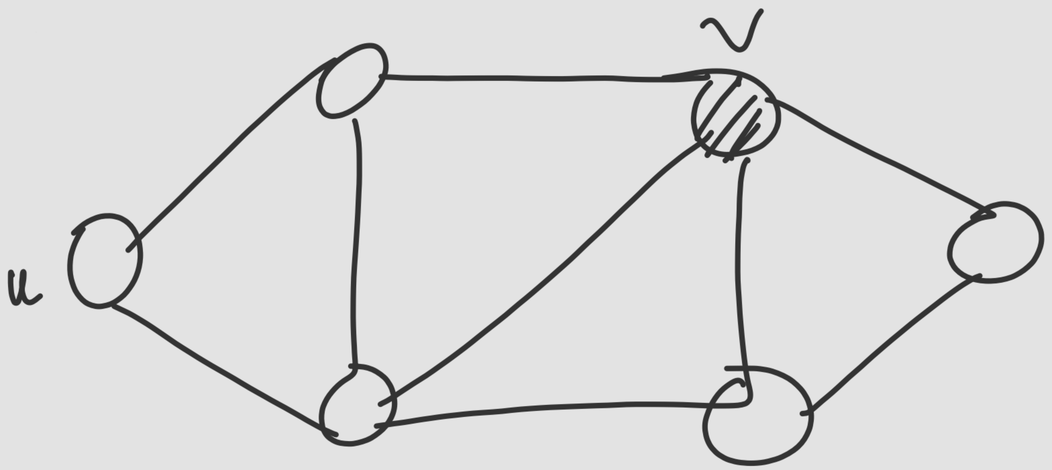


Distance

$d(u,v)$ = length of shortest path

Eccentricity

$ecc(v)$ or $e(v)$

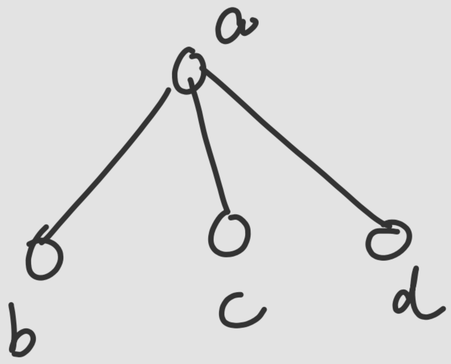
$e(v) =$

Diameter

Radius

$$Diam(G) = \max_{v \in V(G)} e(v)$$

$$Radius = \min_{v \in V(G)} e(v)$$



$e(a) = \max\{1,1,1\} = 1$

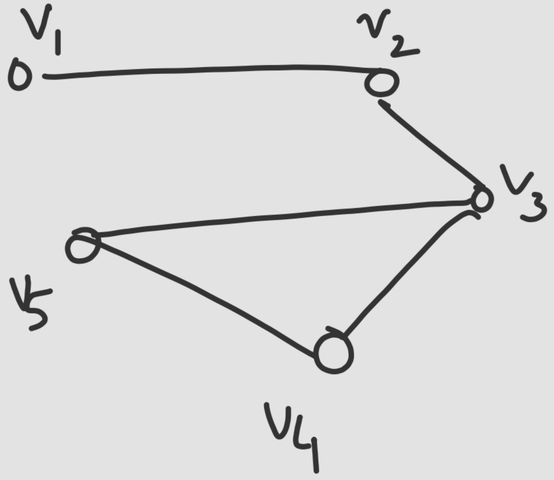
$e(b) = \max\{1,2,2\} = 2$

$e(c) = \max\{1,2,2\} = 2$

$e(d) = \max\{1,2,2\} = 2$

$Diam(G) = 2$

$Radius(G) = 1$



$e(v_1) = 3$

$e(v_2) = 2$

$e(v_3) = 2$

$e(v_4) = 3$

$e(v_5) = 3$

$Diam(G) = 3$

$Radius(G) = 2$

- $d(u,v) = d(v,u)$

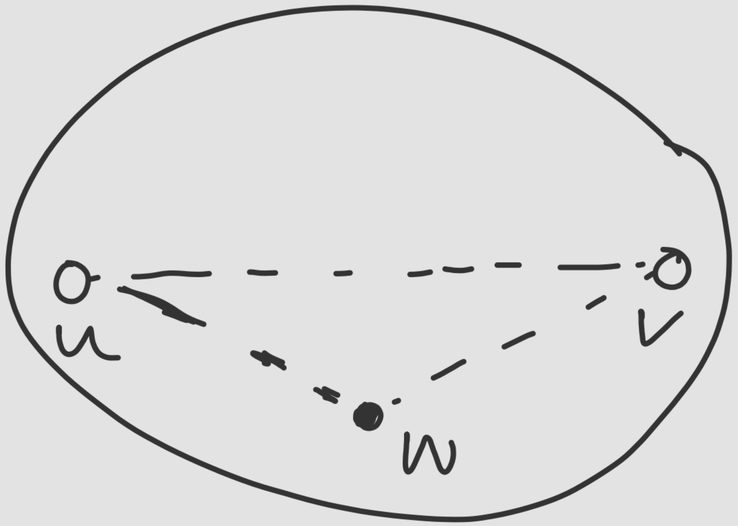
- $d(u,v) + d(v,w) \geq d(u,w)$

- $d(u,v) \geq 1$

  except when $u = v$ $d(u,v) = 0$

For a graph $G(V,E)$

$Diam(G) \leq 2\,Rad(G)$



Let u, v be the vertices with max eccentricity. Let w be the central vertex

$$d(u,v) + d(w,v) \geq d(u,w)$$

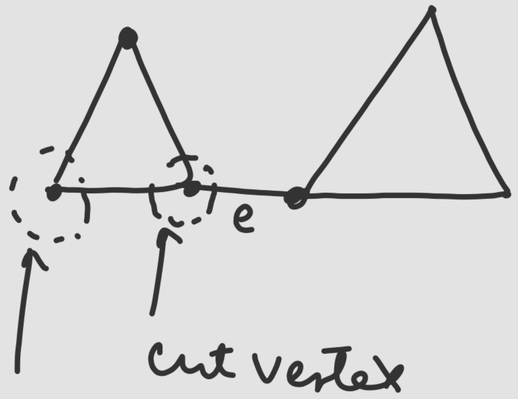
$$\Rightarrow Diam(G) \leq d(u,w) + d(w,v)$$

$$\leq e(w) + e(w)$$

$$\leq 2e(w)$$

$$\leq 2\,radius(G)$$

Cut - Vertex



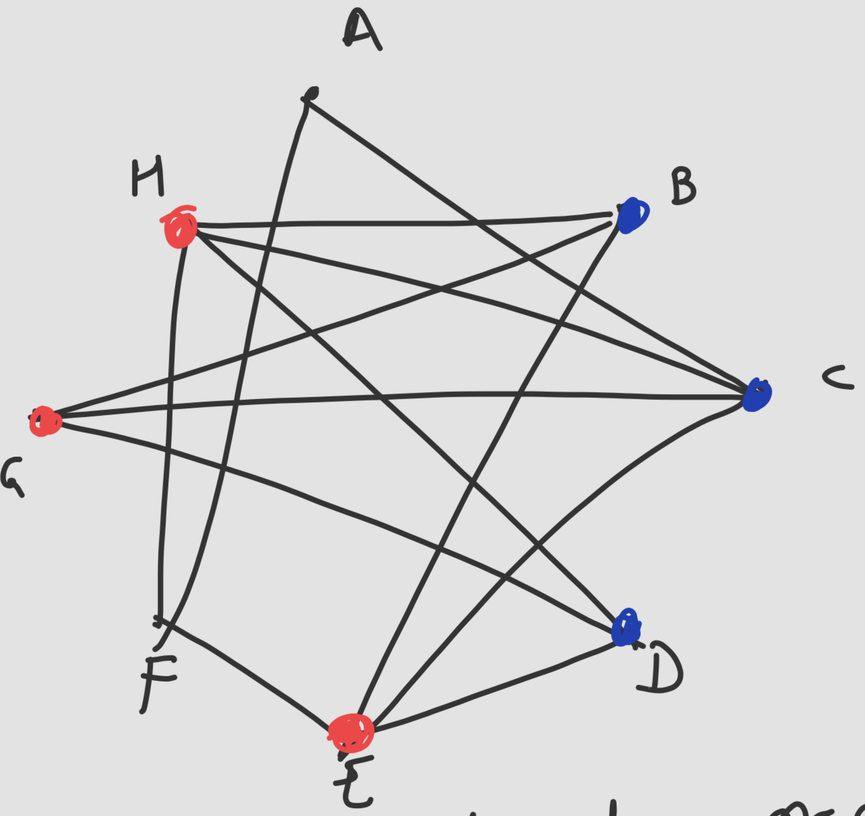
not be
a cut vertex

$G(V,E)$

$v \in V(G)$ is a cut vertex iff

$c(G-v) > c(G)$

① Is the graph planar?

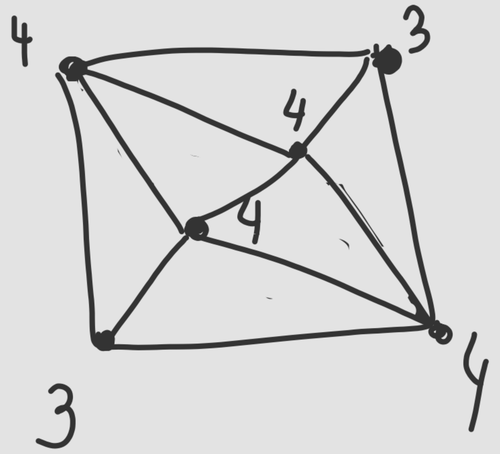


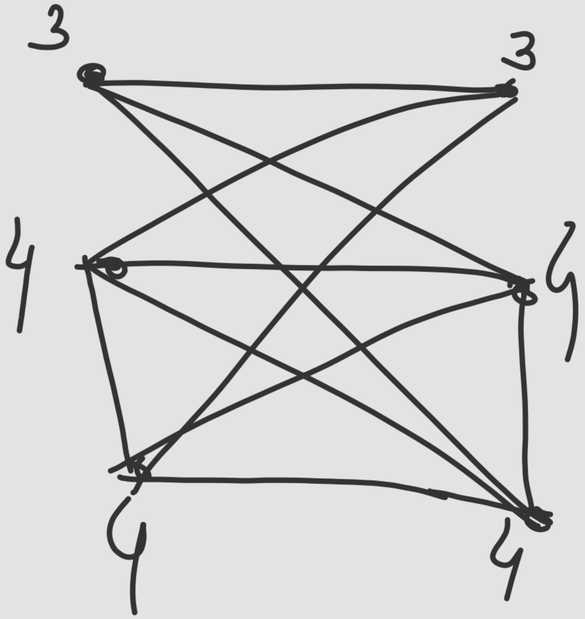
If it is, find the plane graph else justify.

② Given a degree sequence 4, 4, 4, 4, 3, 3

- Draw a planar graph

- Draw a non-planar graph ($K_{3,3}$)





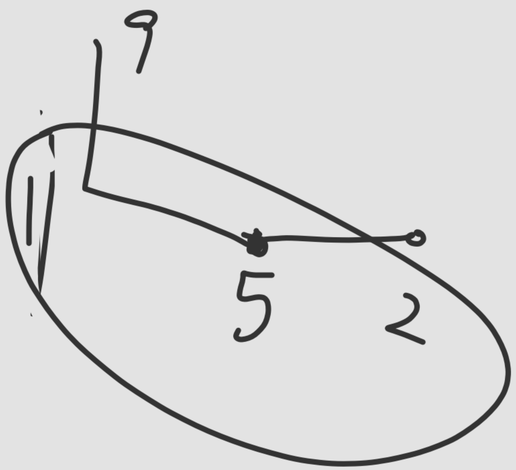
Ques

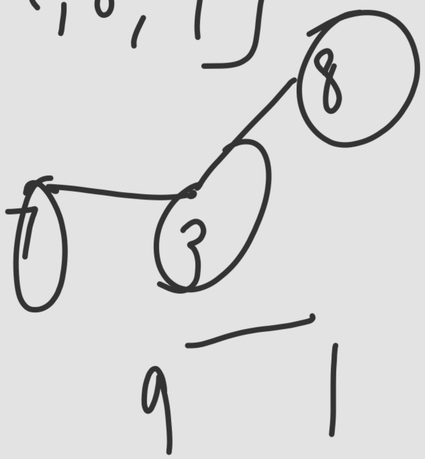
Given the prüfer code for a labelled graph on 10 vertices. Find the graph

5 3 3 1 5 4 6 0

$S = \{5, 3, 3, 1, 5, 4, 6, 0\}$

$L = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$





$S = \{5, 3, 3, 1, 5, 4, 6, 0\}$

$L = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$x =$

$y =$

$\{4, 6, 0\}$

$\{0, 3, 7\}$

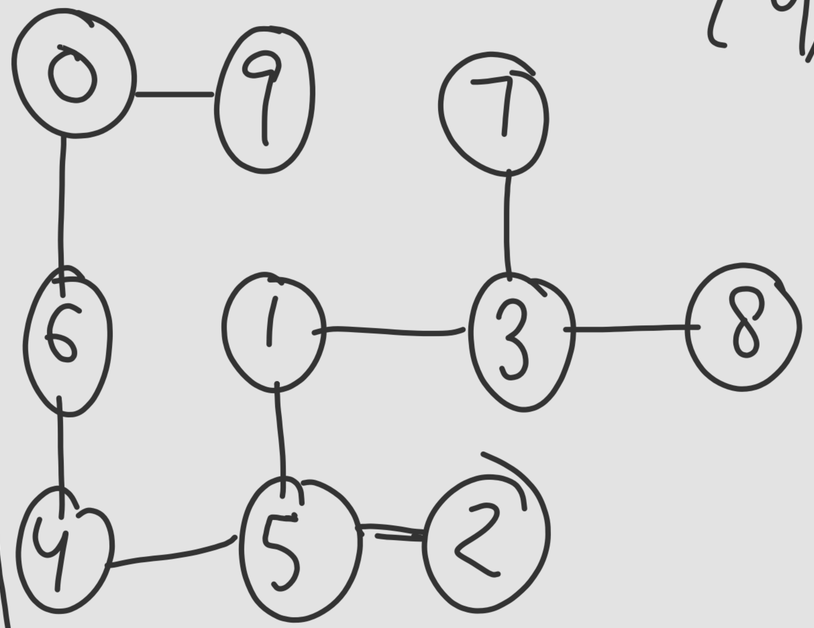
$\{4, 6, 0\}$

$\{0, 1, 4, 5, 6\}$

$\{1, 0\}$

$\{0, 4, 5, 6\}$

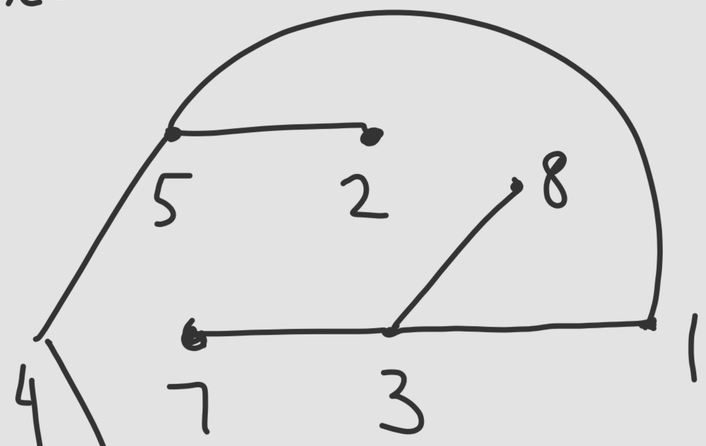
$\{0, 5, 1\}$



Ques $S = 5\ 3\ 3\ 1\ 5\ 4\ 6\ 0$

$L = 0\ 1\ 2\ 3\ 4\ 5\ 6\ 7\ 8\ 9$

$x =$



1 5 4 6 0

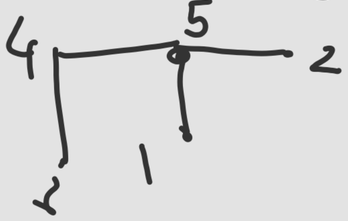
0, 1, 2, 4, 5, 6, 9

2, 4, 6, 0

0, 1, 4, 5, 6, 9

4, 6, 0

0, 4, 5, 6, 9



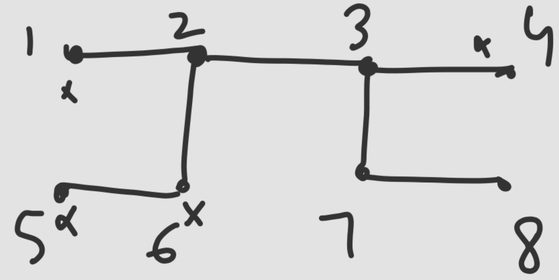
{ }

0, 9

0, 6, 9

0, 4, 9

Ques Write prüfer code for the following tree



$S = (2, 3, 6, 2, 3, 7)$

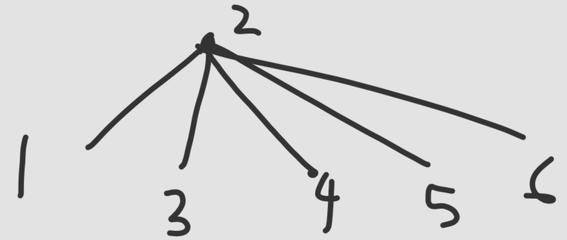
Ques True / False. Justify in a single line

i) All regular graphs with atleast one edge are connected

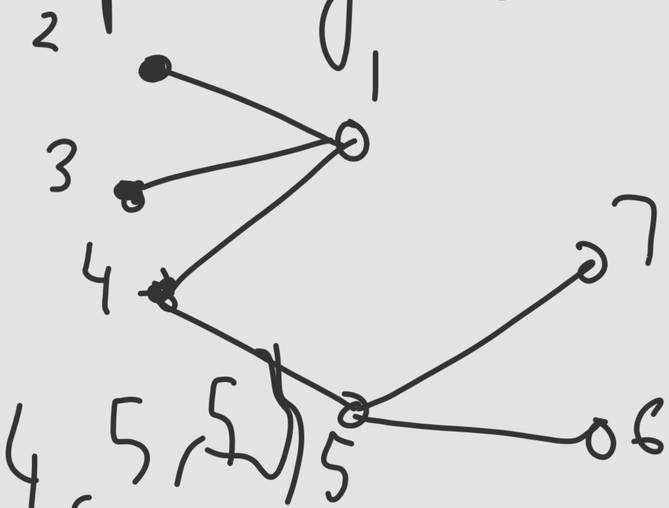
ii) A simple regular graph of degree $d \geq 0$ has chromatic number atleast $d(\geq 1$

Ques

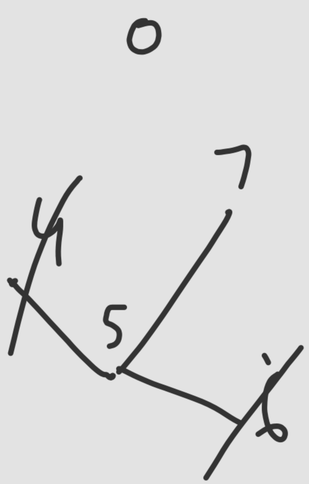
Draw a tree with code 2,2,2,2 on six labelled vertices {1,2,3,4,5,6}



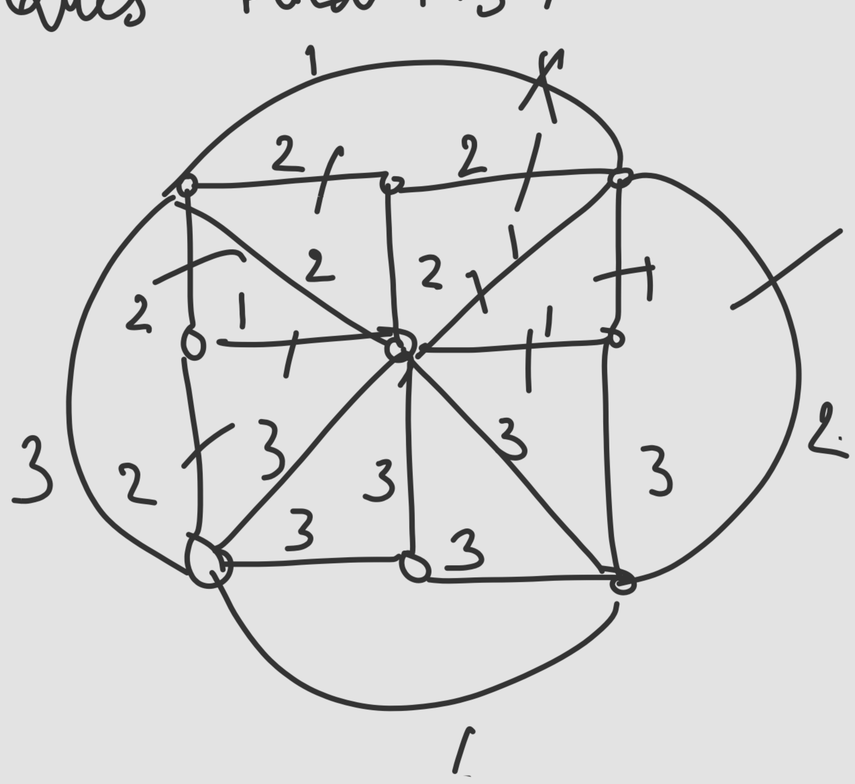
Ques Give the prüfer code for the given spanning tree

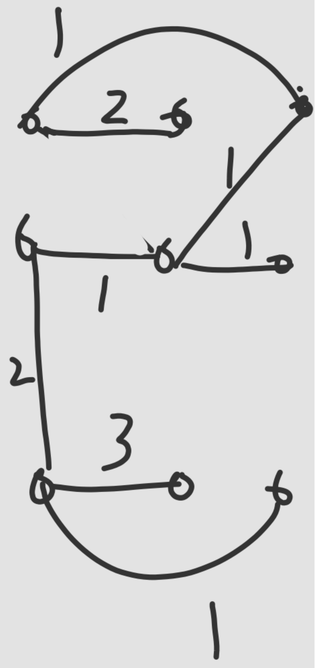


S={1,1,4,5,5,5}



Ques Find MST





ST =

Ques Give DFS starting from (i) c

(ii) B