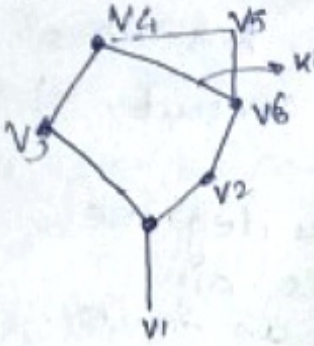
22-10-24.

Graph Theory

Euler Graph } This is connected Graph. If there is an isolated
Euler path. } vertex (Has no edge connect to it). Eulerian Graph)
Euler Circuit. } path has no isolated vertex.

① All edge make alternate series in total path is called Euler Graph / Euler path.

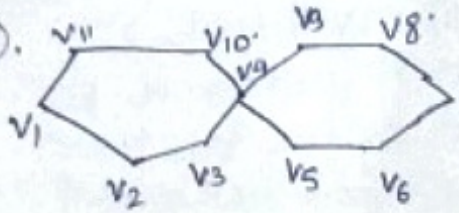
② If Euler Circuit: There are start and ending vertex.

eg. 

→ Kindly ignore line.

All edge needs to be covered

Euler Circuit must cover all edge with start vertex and end vertex to be same.

③. 

$V_1\ V_2\ V_3\ V_4\ V_5\ V_6\ V_7\ V_8\ V_9\ V_{10}\ V_{11}$
$V_7 \rightarrow V_1$ (edge not repeat; but vertex is repeat).

④ Planar Graph: If Graph is given, any edge must not intersect other ~~graph~~ edge is called planar graph.

- no isolated vertex
- must cover all edge from start to end vertex. Exactly ate.

Eulers Graph is a type of a closed walk.

If some closed walk in a graph contain all the edge of the graph then the walk is called Euler's Line and the graph is an Euler's Graph.

* The Euler's line contain all the edge of the graph and Euler's Graph is always connected except for any isolated vertex. Since, isolated vertex do not contribute any thing to the Euler Graph. It is assumed that Euler Graph do not have any isolated vertex.

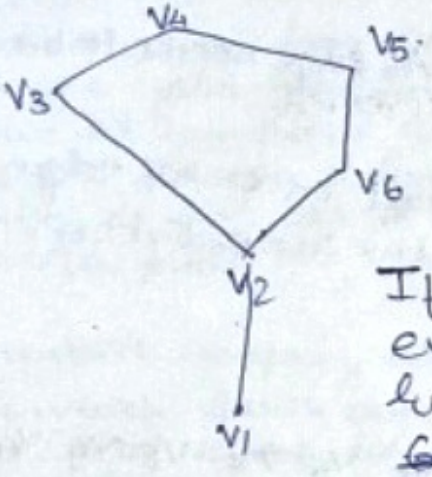
* Euler's Path: A path in a Graph G is called Euler Path if it includes every edge exactly one. ~~Since~~ Since, The path contain every edge exactly one it is also called Euler Trail.

* Euler Circuit

A Euler Path which is circuit is called Euler Circuit.

A graph which Eulerian Circuit is called Euler Circuit.

fig.

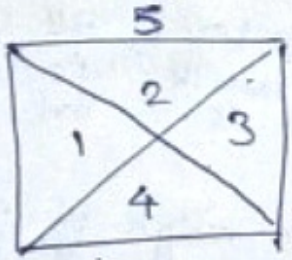


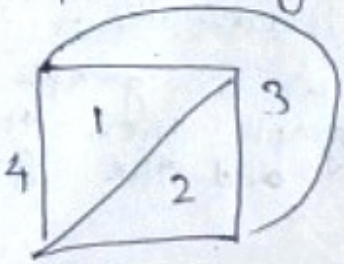
This is Euler Path
OR
Euler Graph, but does not Euler Circuit.

If All ~~edge~~ vertex has degree even then it is an Euler Graph. is an Euler ~~Graph~~. circuit.

Region + vertex - edge = 2

If this condition is held ∴ the path can satisfy to be a planar graph.





↓

4 + 4 - 6 = 2 ∴

~~5 + 6 -~~

24.10.24

Graph Theory:

Planar Graph: 1 edge does not intersect another Graph.
If a Graph has an edge intersect other edge., we change the region to convert planar graph to embedding graph.

Region + edge - Vertex = 2 is property of a planar graph.

Planar Graph: A graph G is said to be planar if G can be draw in the a plane so that no edge intersect except at vertex.

OR

If a Graph is planar and drawing this graph with no edge crossing is called planar graph.

A Drawing of Geometric representation of a graph on any surface with no intersect of its edge is called a embedding graph.

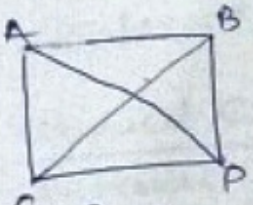
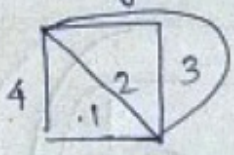
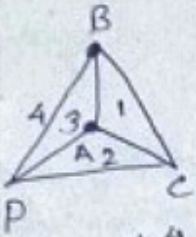


fig 1.

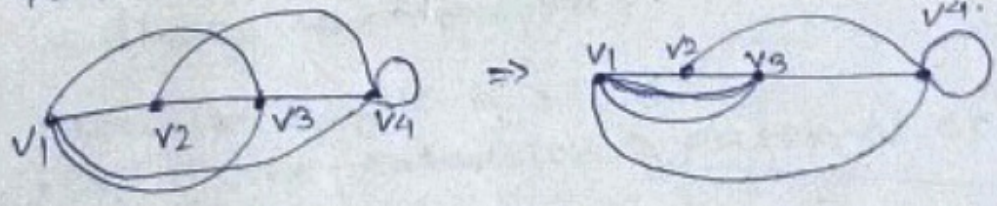


4 region + 4 vertex - 6 edges = 2
fig 2.



4 region + 4 vertex - 6 edges = 2.

fig 2 and fig 3 are ~~embedding~~ planar graphs
fig 2 and fig 3 are embedding graph of fig. 1.
To make planar Graph of.

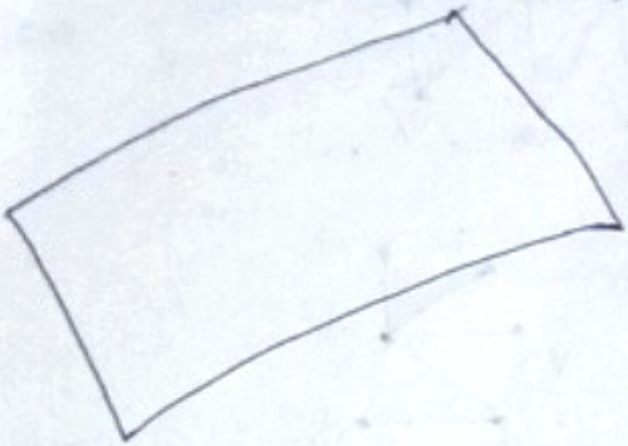


26.10.24

Graph Theory

✓ connected Graph.
✓ Euler Graph iff all vertex are even degree.
✓ Also Eulerian Graph.

Conversion planar to planar Graph.

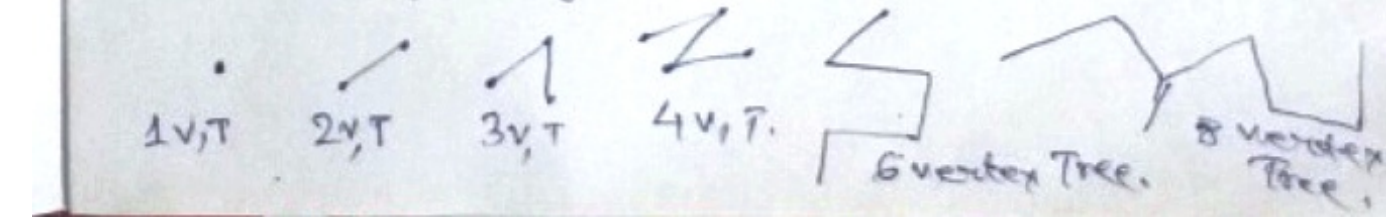


Circuit: self-loop; start / end vertex same, // edge.

Tree: has no self loop, no parallel edge is called a Tree.
What is not circuit is called Tree.
Tree is a graph i.e no self-loop and parallel edge.

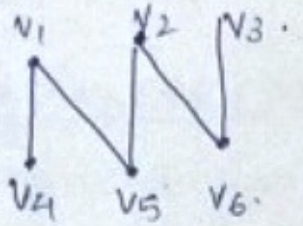
Tree: It is a connected graph without any circuit is called tree. Since parallel edge and self-loop both are allowed in circuit but self loop and parallel edge both not allow in tree.

- Tree may be directed and undirected graph.
- Tree is denoted by Capital T.
- The Tree is one of the most non-linear structure used for algorithm development in computer science.

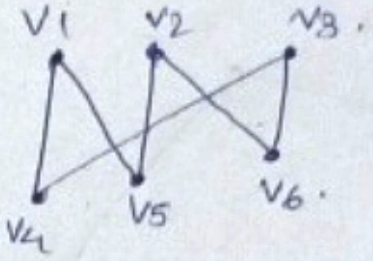


A tree with n vertex has n-1 edge.
Each vertex can have minimum degree 1 and maximum degree n.

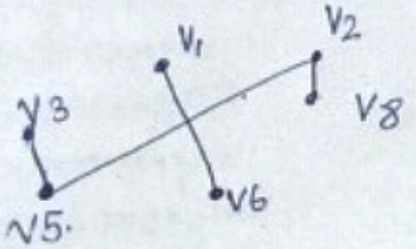
(i)



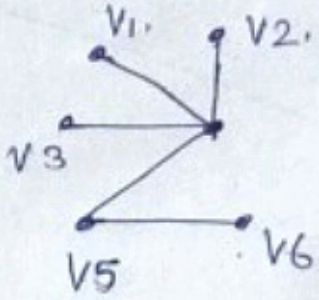
(ii)



(iii)



(iv)



Only 2 is not a Tree, Two. no. is not a simple Graph.
The edge btw V4 and V3 is not simple.