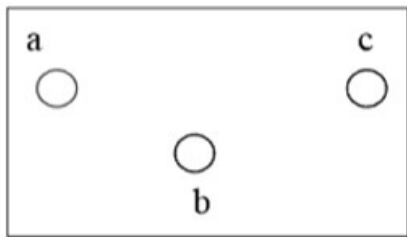


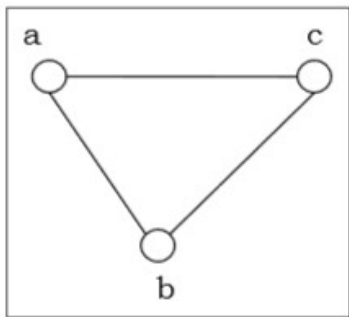
Null Graph

A null graph has no edges. The null graph of n vertices is denoted by N_n



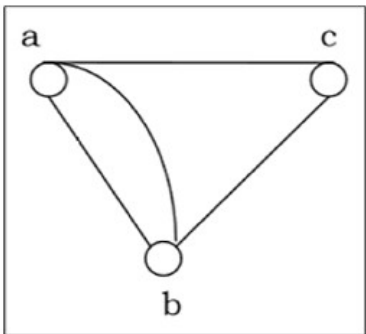
Simple Graph

A graph is called simple graph/strict graph if the graph is undirected and does not contain any loops or multiple edges.



Multi-Graph

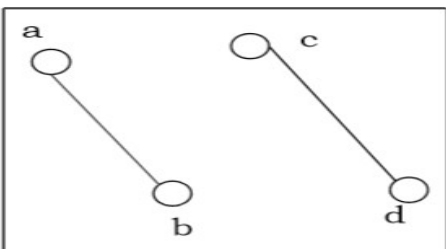
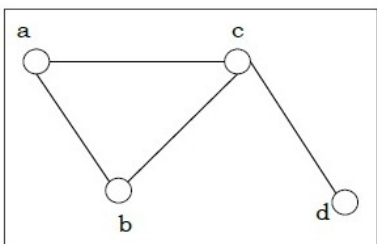
If in a graph multiple edges between the same set of vertices are allowed, it is called Multigraph. In other words, it is a graph having at least one loop or multiple edges.



Connected and Disconnected Graph

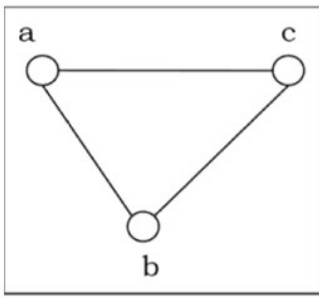
A graph is connected if any two vertices of the graph are connected by a path; while a graph is disconnected if at least two vertices of the graph are not connected by a path. If a graph G is disconnected, then every maximal connected subgraph of G

is called a connected component of the graph G .



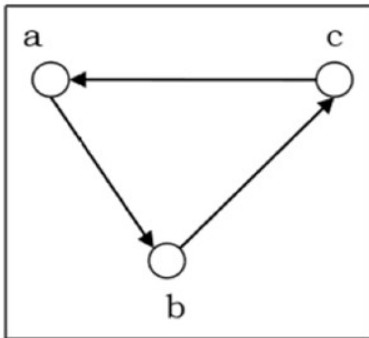
Complete Graph

A graph is called complete graph if every two vertices pair are joined by exactly one edge. The complete graph with n vertices is denoted by K_n



Cycle Graph

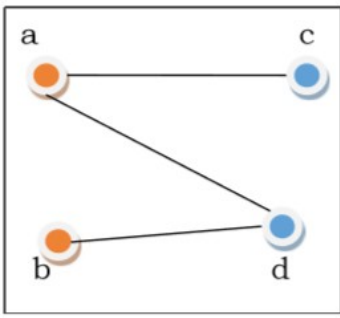
If a graph consists of a single cycle, it is called cycle graph. The cycle graph with n vertices is denoted by C_n



Bipartite Graph

If the vertex-set of a graph G can be split into two disjoint sets, V_1

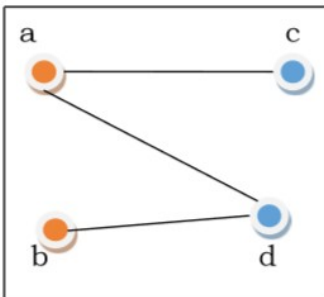
and V_2 , in such a way that each edge in the graph joins a vertex in V_1 to a vertex in V_2 , and there are no edges in G that connect two vertices in V_1 or two vertices in V_2 , then the graph G is called a bipartite graph.



Complete Bipartite Graph

A complete bipartite graph is a bipartite graph in which each vertex in the first set is joined to every single vertex in the second set. The complete bipartite graph is denoted by $K_{x,y}$

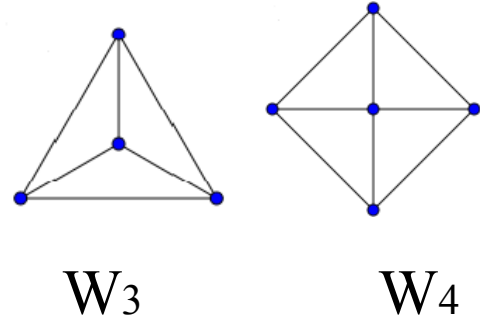
where the graph G contains x vertices in the first set and y vertices in the second set.



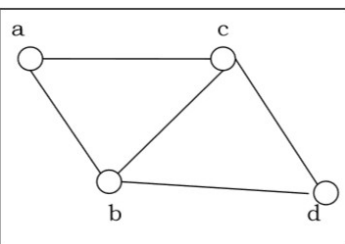
Wheels Graph

For any $n \geq 3$, a wheel W_n , is a simple graph obtained by taking the cycle C_n and adding one extra vertex v_{hub}

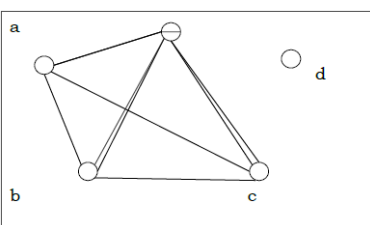
and n extra edges $\{\{v_{hub}, v_1\}, \{v_{hub}, v_2\}, \dots, \{v_{hub}, v_n\}\}$.



Planar graph – A graph G is called a planar graph if it can be drawn in a plane without any edges crossed. If we draw graph in the plane without edge crossing, it is called embedding the graph in the plane.



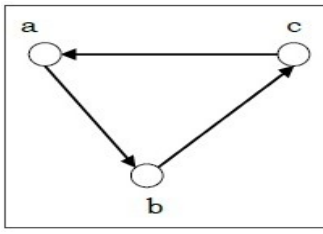
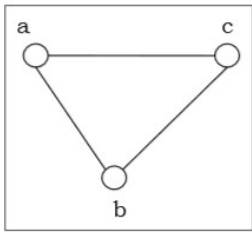
Non-planar graph – A graph is non-planar if it cannot be drawn in a plane without graph edges crossing.



Directed and Undirected Graph

A graph $G=(V,E)$

is called a directed graph if the edge set is made of ordered vertex pair and a graph is called undirected if the edge set is made of unordered vertex pair.



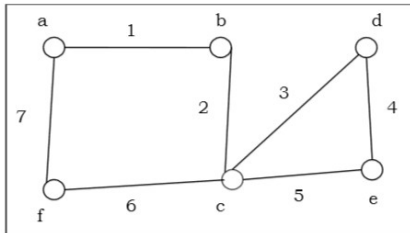
Euler Graphs

A connected graph G

is called an Euler graph, if there is a closed trail which includes every edge of the graph G .

An Euler path is a path that uses every edge of a graph exactly once.

An Euler circuit is a circuit that uses every edge of a graph exactly once. An Euler circuit always starts and ends at the same vertex.



The above graph is an Euler graph as “a1b2c3d4e5c6f7a” covers all the edges of the graph.