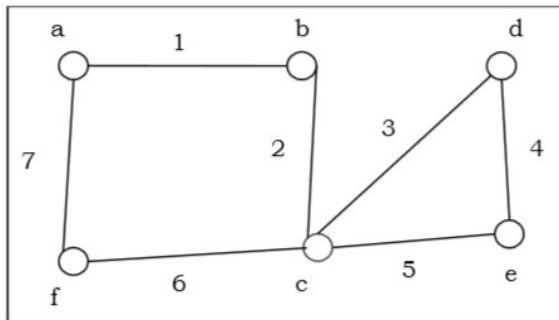




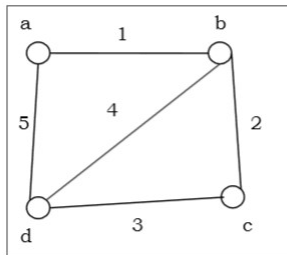
Euler Graphs

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 path starts and ends at different vertices.

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. A connected graph G is an Euler graph if and only if all vertices of G are of even degree, and a connected graph G is Eulerian if and only if its edge set can be decomposed into cycles.



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



Hamiltonian Graphs

A connected graph G is called Hamiltonian graph if there is a cycle which includes every vertex of G and the cycle is called Hamiltonian cycle. Hamiltonian walk in graph G is a walk that passes through each vertex exactly once.

If G is a simple graph with n vertices, where $n \geq 3$ If $\deg(v) \geq \frac{n}{2}$ for each vertex v , then the graph G is Hamiltonian graph. This is called **Dirac's Theorem**.

If G is a simple graph with n vertices, where $n \geq 2$ if $\deg(x) + \deg(y) \geq n$ for each pair of non-adjacent vertices x and y , then the graph G is Hamiltonian graph. This is called **Ore's theorem**.



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