Eulerian Graphs

A graph $G = (V, E)$ is **Eulerian** if it has a circuit that covers every edge exactly once. Note – vertices can be repeated, but not edges. Such a circuit is called an *Eulerian Circuit*.

Theorem: A connected simple graph $G = (V, E)$ is Eulerian if and only if every vertex in G has even degree. (Note we assume G is simple and finite.)
Proof: (Will be done later in the semester.)
Notes:

- Determining if a graph G is Eulerian can be performed in polynomial time.
- We also are interested in graphs that have *Eulerian walks*, i.e., walks that cover every edge exactly once.
- Finding Eulerian Circuits and Eulerian Walks is used in Assembling Genomes!