Eulerian cycle $\iff$ all vertices have an even degree

Proof by induction: $G=(V,E)$

Basis: $|V| = 2$, 

$|V| = 3$, 

Induction: $n > 2$, 

all vertices have degrees ≥ 2 so doesn't get stuck

E_{v_0}

$G' = (V', E - E_{v_0})$

an even # of degrees removed from even # of degrees, $\therefore E'$ is still even

Corollary

Eulerian path, but no Eulerian circuit $\iff$ exactly two vertices with odd degrees

$\therefore$ Eulerian paths have either 0 or 2 odd degree vertices

Eulerian circuits have 0 odd degree vertices