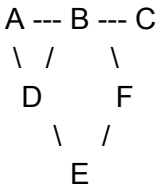
Exercises:

1. Number of Odd degree Nodes is even — Prove this mathematically using the formulas mentioned in the slides
2. Prove the following:

$$dist\,(u, v) \leq dist\,(u, x) + dist\,(x, v)$$

$$for\ all\ vertices\ u, v, x\ with\ equality\ holding\ iff\ x\ is\ on\ a\ shortest\ path\ from\ u\ to\ v.$$

3. Find all cut-vertices (articulation points) and bridges in the following graph. A cut-vertex is a vertex whose removal increases the number of connected components, and a bridge is an edge whose removal does the same. Find a way to do it in O(V+E) time



4. Given a graph, determine the minimum number of edges to add to make the graph 2-vertex connected.