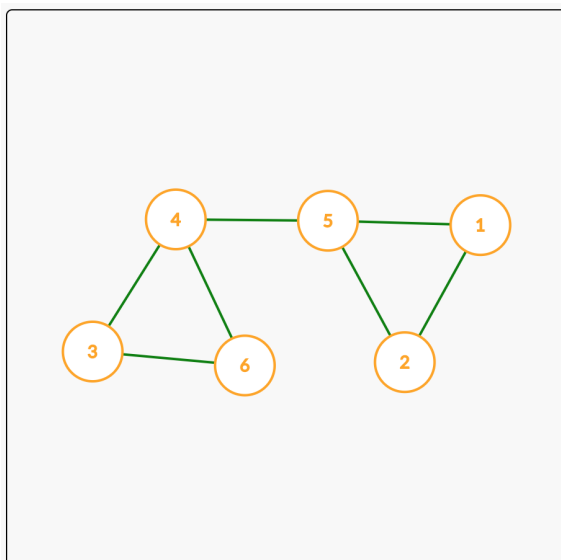
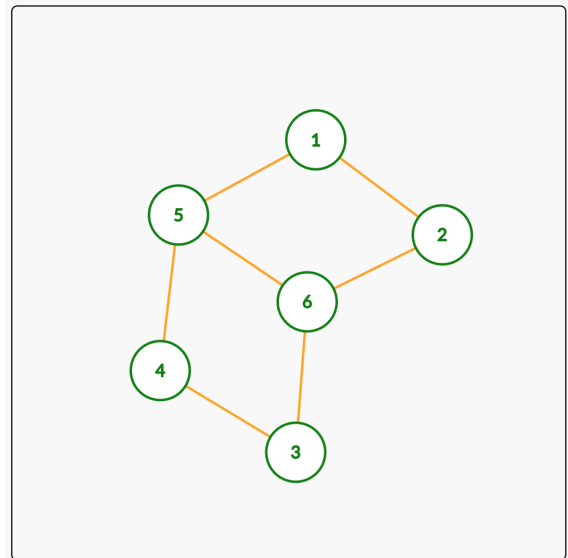


# Algo-Project

## Part 2 : Theoretical notions

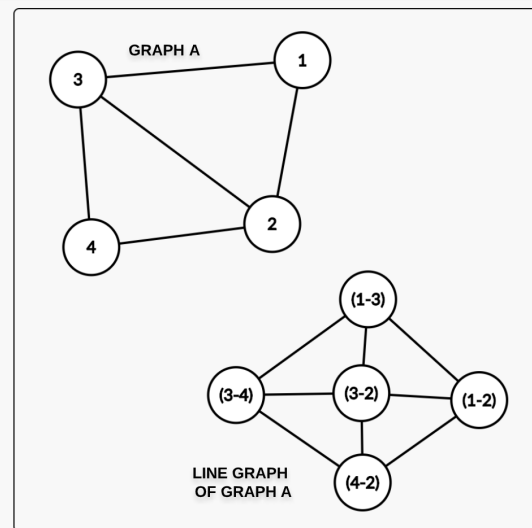
Lets start by redefining the Hamiltonian path and the Eulerian path problem, and what a line graph is.

- A graph has a Hamiltonian path, if and only if, we can draw a path that cross only one time every node of the graph. We can note if the path begin and finish at the same node, the path is cyclic.
- A Hamiltonian path could do not cross every edge of the graph.



- A graph has a Eulerian path, if and only if, we can draw a path that cross only one time every edges of the graph. We can note if the path begin and finish at the same node, the path is cyclic.
- A Eulerian path could cross more than one time a node.

- Building a line graph of a graph in a simple way to explain it, is that every edges between two nodes, become a node. To connect theses new nodes, we connect them with old edges that were connected to the same node.



Next, the connexion between theses 3 elements, if we build a line graph of an Eulerian path, we will get a Hamiltonian path. But the converse is not true, a line graph of a Hamiltonian path could not be an Eulerian path.