Graph isomorphism ##

Two graphs are isomorphic if they are identical in every way except for vertex labels

Definition: Isomorphic graphs
Let $G = (V, E)$ and $G' = (V', E')$. G and G' are isomorphic if there is a bijection $f: V \to V'$ such that for every pair of vertices $x, y \in V$, $\{x, y\} \in E$ if and only if $\{f(x), f(y)\} \in E'$.

The function f is called an isomorphism from G to G'

Graph properties preserved under isomorphism:

- vertex degree - $\deg(v)$ in G = $\deg(f(v))$ in G'
- degree sequence - list of all vertex degrees in non-increasing order
- total degree
- graph order (i.e ~~total~~ # of vertices) $|V|$ in G = $|V'|$ in G'
- graph size (i.e total # of edges) $|E|$ in G = $|E'|$ in G'
- connectivity