

# Graph Isomorphism

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Graph Isomorphism is very much defined in its name: Iso (same) morphism (shape) of graphs. In more detail, two finite graphs are isomorphic if they share the same number of vertices connected in the same way. Formally, two finite graphs  $G$  and  $H$  with graph vertices  $G.V$  and  $H.V$  labelled  $V_n = \{1, 2, 3, 4, \dots, n\}$ , and graph edges  $G.E$  and  $H.E$  are said to be isomorphic if  $f : G.V \rightarrow H.V$  is an edge-preserving bijection. Meaning that there is permutation  $p$  of  $V_n$  so that edges  $(u, v) \in G.E \iff (p(u), p(v)) \in H.E$  [1].

## References

- [1] G. Chartran. *Isomorphic Graphs*. Dover, 1985.