

Discrete Structures

Fight for Survival

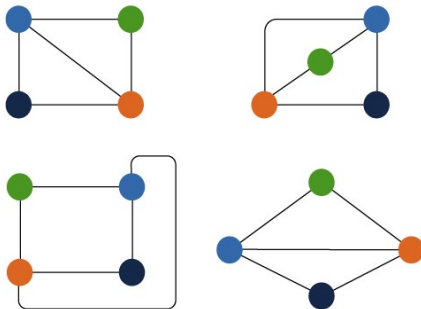
Dr. Mudassir Shabbir

August 27, 2026



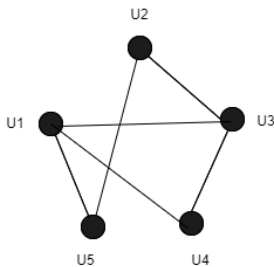
Isomorphism

Multiple graphs can have same underlying structure (connectivity) while having different labels for vertices. Such graphs are called isomorphic graphs.

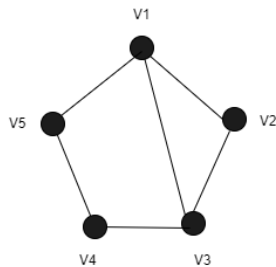


Isomorphic Graphs

Two graphs G_1 and G_2 are said to be isomorphic if:
there exists a bijection π from vertices of G_1 to the vertices of G_2
such that there is a $(u, v) \in E(G_1)$ if and only if $(\pi(u), \pi(v)) \in E(G_2)$.



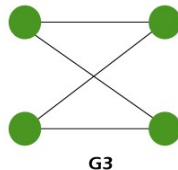
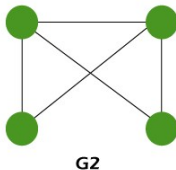
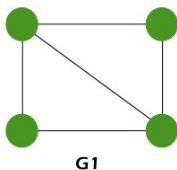
G



H

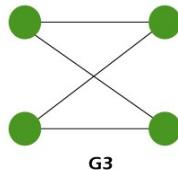
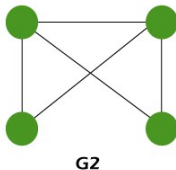
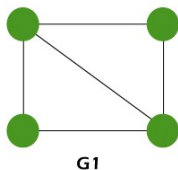
Isomorphic Graphs

Which of the following graphs are isomorphic?



Isomorphic Graphs

Which of the following graphs are isomorphic?



Solution: G_1 and G_2 are isomorphic but not G_3 .