An alternative representation of isomorphisms and automorphisms

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Let the graphs G and H be given. A k-morphism ($(-k)$-morphism respectively) f from G to H is a bijection between the families of k-element subsets of vertices of G and H such that the induced subgraphs X_G and $f(X)_H$ ($G-X$ and $H-f(X)$ respectively) have the same number of edges. In our contribution, we study the intersection preserving k-morphisms ($(-k)$-morphisms), which can be used for representation of the isomorphisms from G to H or the automorphisms of G. We show that the automorphism group and the vertex stabilisers of G can be represented by some subsets of intersection preserving k-morphisms ($(-k)$-morphisms). We also consider some perspectives and possibilities provided by these mappings. For example, reformulations of the Reconstruction and Graham conjectures; definition of generalised symmetries in (asymmetric) graphs.