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Two matrices of same size are called permutation equivalent if they are equal to one another up to a row permutation. The problem asks for an Euclidian embedding of the quotient space induced by the row permutation equivalence relation. This problem admits several equivalent formulations. We shall discuss representations inspired by results from commutative algebra theory, measure theory, and reproducing kernel Hilbert space theory. This problem has direct application to graph classification problems where the underlying network has a natural equivariance property. (Received September 15, 2019)