Free Quotients of Finitely Presented Groups

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Abstract

We describe a computational, heuristic approach to the problem of deciding whether or not a given finitely presented group has a free quotient of rank two or more. Our strategy is to construct a finite nilpotent quotient of the given group, to search for quotients that are free within a variety containing that quotient, and then lift to the original group. We give theoretical justification to our strategy, and describe successful computations with sections of the Picard group $\mathrm{SL}_2(\mathbb{Z}[i])$.