Automatic Generator of Conformal Bootstrap Equation for various Global Symmetry

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Abstract:

Conformal bootstrap is a non-perturbative method to extract bounds on CFT data from the consistency of correlation functions. Recently, it found to be powerful enough to estimate the scaling dimension or OPE coefficients rigorously and in the case of 3 dimensional Ising model, its estimation for relevant operators is much more accurate than Monte Carlo simulation. To write down all bootstrap equations of CFTs with arbitrary global symmetry is a bit complicated and tedious, but it can be done only with group-theoretic information about symmetry. I formulated this monotonous procedure so clear that it can be done automatically in Mathematica in principle. Its application to the order-8 dihedral group is shown as an example.