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## Shapovalov elements for classical and quantum groups.

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Shapovalov elements  $\theta_{\beta,m}$  in the classical or quantum universal enveloping algebra of the negative Borel subalgebra of a simple Lie algebra are parameterized by a positive root  $\beta$  and a positive integer  $m$ . They relate the canonical generator of a reducible Verma module with highest vectors of its Verma submodules. We obtain a factorization of  $\theta_{\beta,m}$  to a product of  $\theta_{\beta,1}$ , where the latter is calculated as a re-scaled matrix element of the inverse Shapovalov form

via a generalized Nigel-Moshinsky algorithm. This way we explicitly express all Shapovalov elements for a classical simple Lie algebra through the Cartan-Weyl basis. In the case of quantum groups, an analogous presentation is available through matrix elements of the universal R-matrix in a representation that goes to adjoint in the classical limit.

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