

# Graphs and the (co)homology of Lie algebras

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In this paper, we develop a diamond graph theory and apply the theory to the (co)homology of the Lie algebra generated by positive systems of the classical semi-simple Lie algebras over the field of complex numbers. As an application, we give the weight decomposition of the diamond Lie algebra with Dynkin graph  $A_{n+1}$  and compute the rank of every weight subgraph of it.

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