

# Lie algebras, extremal elements and diagrams

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Simple finite-dimensional Lie algebras are often generated by extremal elements: elements  $x$  for which  $[x, [x, y]] = \lambda x$  for all  $y$ . For example, long root elements in classical Lie algebras are extremal. We look at such Lie algebras generated by some extremal elements, where we prescribe which extremal elements commute and which don't. This information can be put into a diagram. We investigate the relation between the diagram and the Lie algebra, and find diagrams corresponding to each of the infinite series of classical Lie algebras  $A_n, B_n, C_n$  and  $D_n$ .

Note that this is not a finished piece of research and that ideas from the audience will be very welcome.