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What is a Diagram? Views from Category Theory and Logic

We examine the rôle of diagrams in sequent calculus and their correspondence to the categorical notion of diagram in limits and colimits. In Peirce's theory of signs, the diagram is a type of sign which represents the internal relations of its object, more specifically, as an icon that relates indices of the object's constituents. This grammatical element is made explicit in the notation of the sequent calculus, where it is closely linked to deductive inference. We consider in particular how the characterization of the diagram determines different modes of inference, and thus different kinds of logic (classical, intuitionistic, linear, etc.), each with its own set of inference rules. A correspondence is then made with the cognate notion of diagram in category theory (as presented by Awodey, Leinster), where the limit structure, dualized into the colimit, is said to bear on the diagram of an index category. We consider what the characterization of the diagram might amount to in a categorical perspective. To that end, we introduce the generalization of the diagram into a category of diagrams, i.e. a category of set-valued functors.