Syllogistic Reasoning with 108 Inference Rules While Case Quantities Change

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Abstract : A syllogism is a deductive inference scheme used to derive a conclusion from a set of premises. In a categorical syllogisms, there are only two premises and every premise and conclusion is given in form of a quantified relationship between two objects. The different order of objects in premises give classification known as figures. We have shown that the ordered combinations of 3 generalized quantifiers with certain figure provide in total of 108 syllogistic moods which can be considered as different inference rules. The classical syllogistic system allows to model human thought and reasoning with syllogistic structures always attracted the attention of cognitive scientists. Since automated reasoning is considered as part of learning subsystem of AI agents, syllogistic system can be applied for this approach. Another application of syllogistic system is related to inference mechanisms on the Semantic Web applications. In this paper we proposed the mathematical model and algorithm for syllogistic reasoning. Also the model of iterative syllogistic reasoning in case of continuous flows of incoming data based on case–based reasoning and possible applications of proposed system were discussed.
Keywords : categorical syllogism, case-based reasoning, cognitive architecture, inference on the semantic web, syllogistic reasoning

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