# Justification logic

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## Abstract

Traditional modal logics feature formulas of the form $K\,A$ that stand for 'the agent knows that $A$'. The classical semantics for these logics is given by possible world models, in which the formula $K\,A$ is true if $A$ is true in all worlds that the agent considers possible. However, this approach is missing the justified part of Plato's classic characterization of knowledge as justified true belief. Justification logics can fill this gap. Instead of formulas $K\,A$, the language of justification logics includes formulas of the form $t : A$ that mean 'the agent knows that $A$ for reason $t$'. The evidence term $t$ in this expression can represent a formal proof of $A$ or an informal reason why $A$ is known. Moreover, justification logics include operations on these terms to reflect the agent's reasoning power. For instance, if $A \rightarrow B$ is known for reason $s$ and $A$ is known for reason $t$, then $B$ is known for reason $s \times t$, where the binary operation $\times$ models the agent's ability to apply modus ponens.

In our tutorial, we give an introduction to justification logic and present some of the main results in this area.