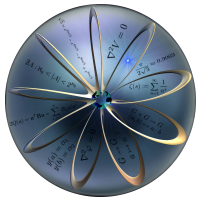

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promise problem

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A *promise problem* is a generalization of a decision problem. It is defined by two decision problems L_1 and L_2 with $L_1 \cap L_2 = \emptyset$. A Turing machine decides a promise problem if, for any $x \in L_1 \cup L_2$, it accepts when $x \in L_1$ and rejects if $x \in L_2$. Behavior is undefined when $x \notin L_1 \cup L_2$ (this is the promise: that x is in one of the two sets).

If $L_2 = \Gamma^+ \setminus L_1$ then this is just the decision problem for L_1.