

Model Checking: From BDDs to Interpolation

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Exercise 1

Write 2 CTL formulas.

1. f_1 is true in a state iff
the state is the start of a path along
which p holds **at least** twice
2. f_2 is true in a state iff
the state is the start of a path along
which p holds **exactly** twice

Exercise 2

A Kripke structure M is represented by propositional formulas in CNF form as follows:

- $V = (v_1, \dots, v_n)$ is the vector of Boolean variables that represent the states
- $S(V)$ - a CNF formula representing the set of states in M
- $R(V, V')$ - a CNF formula representing the transition relation of M
- $AP = \{p_1, \dots, p_n\}$ and for every p_i in AP , $p_i(V)$ is a CNF formula representing the set of states in which p_i is true

Exercise 2 (cont.)

Given two different states s, t , represented as CNF formulas.

Write a propositional formula f_k , which is satisfied iff there are two disjoint paths of length k from s to t :

$\pi = s, s_1, \dots, s_k, t$ and $\pi' = s', s'_1, \dots, s'_k, t'$

such that for every $1 \leq i \leq k$, $L(s_i) \subseteq L(s'_i)$