Lehr- und Forschungsgebiet
Mathematische Grundlagen der Informatik
RWTH Aachen
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Algorithmic Model Theory — Assignment 3

Due: Monday, 7 November, 12:00

Exercise 1

In the lecture DOMINO was defined as the class of all domino systems $\mathcal{D}$ which admit a tiling of $\mathbb{N} \times \mathbb{N}$. Show that DOMINO is co-r.e..
Hint: Construct a tree whose nodes are tilings of finite squares and use König's Lemma.

Exercise 2

Let $\Pi = \{\exists, \forall\}^{\leq k}$ be the set of all quantifier prefixes of length not larger than k for some fixed k and p a *finite* arity sequence (i.e. $\sum_{n \geq 1} p(n)$ is finite). Prove that $\mathrm{Sat}([\Pi, p, (0)]_{=})$ is decidable.

Exercise 3

Construct infinity axioms in the classes

(i) $[\exists\forall^2, (0), (1)]_{=}$

(ii) $[\forall\exists\forall, (0, 1), (1)]$

(iii) $[\forall\exists, (0), (1)]_{=}$