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Homeworks for

Komplexitätstheorie

A. Y. 13/14

Sheet 7

Exercise 7.1 Design padding functions for the languages CLIQUE and INDEPENDENT SET and show that they have the required properties.

Exercise 7.2 Show the following:

a) Every constant function $n \mapsto c$, $c \in \mathbb{N}$, is time-constructible.

b) The functions $n \mapsto \lfloor \log n \rfloor$ and $n \mapsto \lceil \log n \rceil$ are space-constructible.

Exercise 7.3 Show the following:

a) If $f(n)$ is time-constructible, then $f(n)$ is space-constructible.

b) Time- and space-constructible functions are closed under addition and multiplication.

Exercise 7.4 Show that $\mathrm{DSpace}(S(n)) = \text{co-}\mathrm{DSpace}(S(n))$ provided that $S(n) \geq \log n$.

Hint: In the lecture, this was shown under the additional assumption that $S(n)$ is space-constructible.