Technische Universität München
Fakultät für Informatik
Lehrstuhl für Effiziente Algorithmen
Prof. Dr. Ernst W. Mayr
Chris Pinkau

Summer Term 2015
Problem Set 07
June 1, 2015

Complexity Theory

Due date: June 8, 2015 **before** *class!*

Problem 1 (10 Points)

Show that for $f(n) = o(\log \log n)$ it holds that $\mathbf{SPACE}(f(n)) = \mathbf{SPACE}(1)$.

Problem 2 (10 Points)

Give an example of a non-regular language that is in $\mathbf{SPACE}(\log \log n)$.

Problem 3 (10 Points)

Show the following claims:

1. 2SAT is **NL**-complete.
2. If $A \preceq_m^{\log} B$, then $A \preceq_m^p B$.

Problem 4 (10 Points)

Show that $\mathbf{SPACE}(\mathcal{O}(n)) \neq \mathcal{P}$.