UNIVERSITY OF KONSTANZ DEPARTMENT OF COMPUTER & INFORMATION SCIENCE Prof. Dr. Sven Kosub / Michael Aichem Complexity Theory Winter 2016

Assignment 3

Issue date: 09 Nov 2016 **Due date:** 16 Nov 2016

Exercise 1.

Show that for all time bounds $t : \mathbb{N} \to \mathbb{N}$ satisfying $t(n) \ge n$, the following holds:

 $multiT-NTIME(t) \subseteq 2T-NTIME(t)$

Exercise 2.

Show that for all time bounds $t : \mathbb{N} \to \mathbb{N}$ satisfying $t(n) \ge n$, the following holds:

 $\operatorname{RAM-DTIME}(t) \subseteq \operatorname{multiT-DTIME}(O(t^3))$

Exercise 3.

Show that for all time bounds $t : \mathbb{N} \to \mathbb{N}$ satisfying $t(n) \ge n$, the following holds:

 $\operatorname{multiT-NTIME}(t) \subseteq \operatorname{RAM-NTIME}(O(t))$