

Word Equations and SLPs: Exercise Sheet 2

Task 10 Show that the algorithm of word equations can be determinized, when we apply it to equality of SLPs. What is the size of the kept SLPs? How many “rounds” of compression do we have to make?

Task 11 Show that the exponential bound on the length of a -blocks for length-minimal solutions is tight (the exact constant at the exponent is not tight, though).

Task 12 Show that the exponential bound on the exponent of periodicity (but not with a $2^{\mathcal{O}(n)}$ bound, though) can be inferred already from the algorithm for word equations plus the bound on the length of a -blocks in the length-minimal solutions.

Hint: How does the exponent of periodicity changes after one compression step? What is the difference between pair compression and block compression?

Task 13 We would like to extend the exponential bound on the exponent of periodicity to the case when the regular constraints are allowed.

Describe, how to extend the system of equations that describe the lengths of a -blocks, so that the regular constraints are taken into the account.