

Homework 4

1. Give an automaton that can recognise the language $L(a^* \cdot b \cdot b^* \cdot (a \cdot a^* \cdot b \cdot b^*)^*)$.
2. Assume that s^{-1} stands for the operation of reversing a string s . Given the following *reversing* function on regular expressions and the set

$$Rev A \stackrel{\text{def}}{=} \{s^{-1} \mid s \in A\}$$

prove that

$$L(\text{rev}(r)) = Rev(L(r))$$

holds.

3. Palindromes
4. (Optional) The tokenizer in `regexp3.scala` takes as argument a string and a list of rules. The result is a list of tokens. Improve this tokenizer so that it filters out all comments and whitespace from the result.
5. (Optional) Modify the tokenizer in `regexp2.scala` so that it implements the `findAll` function. This function takes a regular expressions and a string, and returns all substrings in this string that match the regular expression.