

Exercises for FLL, Fall 2014, sheet 4

Return Wed Oct 1, in class

Exercise 1. Let h be the homomorphism $h(a) = 01$, $h(b) = 0$. Find $h^{-1}(L)$, where $L = (\mathbf{10+1})^*$.

Exercise 2. Prove or disprove the following conjecture:

Let M be some regular language over $\Sigma = \{0,1\}$. Define $L_{|M|} = \{0^n \in \{0\}^* \mid n = |v| \text{ for some word } v \in M\}$. Then L is regular. *Hint:* use the tool of homomorphisms!

Exercise 3. Prove that the language $L = \{0^n \mid n = pq \text{ for two primes } p, q\}$ is not regular.