Formal Languages and Automata Theory, SS 2017. Homework 4 (due Week 9, respectively 10)

0. Remaining exercises from previous homeworks.

1. Prove that the following languages are not regular:

   (a) $L = \{0^i | i \geq 1 \text{ is a perfect square}\}$;

   (b) $L = \{w | w \text{ is binary string with equal number of } 0's \text{ and } 1's\}$;

   (c) $L = \{w | w \text{ is binary string of the form } 0^m 1^n,\ m < n; m \geq 0, n \geq 0;\ m, n \text{ integer numbers}\}$;

   (d) $L = \{0^{2^n} | n \geq 1\}$;

   (e) $L = \{0^n | n \text{ is a prime numbers}\}$;

   (f) $L = \{0^m 1^n 0^{m+n} | m \geq 1,\ n \geq 1\}$.