

Homework 13

Mathematics in Computer Science

1. Write a regular expression for the set of all strings of 0's and 1's that contain at least one 0 and at least 1 one.
2. Write a regular expression for the set of all strings of 0's and 1's not containing the substring 010.
3. Write a regular expression for the set of all strings of 0's and 1's that have two blocks of 1's. e.g. $00 \cdots 011 \cdots 100 \cdots 011 \cdots 100 \cdots 0$. (A string is called a *block* if it is composed of one or more 1's)
4. What is the set of strings denoted by the regular expression $(01 + 10)^*$? List the seven shortest strings and then give a brief description of the set.
5. Is S^* the smallest set of strings containing S that is closed under union, concatenation, and star?