

Regular expressions

1. Write a regular expression for the following sets of binary strings. Use only the basic operations: $() | *$.

a) All binary strings

b) All binary strings except empty string

c) All binary strings that begin with 1 and end with 1

d) All binary strings that end with 00

e) All binary strings that contain at least three 1's

2. Describe in words what the following regular expressions mean:

a) $(0|1)^*1010(0|1)^*$

b) $a^*b^*c^*$

c) $aa^*bb^*cc^*$

3. Find all strings in the following regular expressions of length less than four.

a) $(1)(1|\emptyset)^*$

b) $(a|b)^*b$

4. Give some examples of strings that match and do not match the following regular expressions:

regular expression	matches	does not match
$[A-Z]\{3,4\}$		
$[a-z\emptyset-9]\{3,\}$		
$[a-z']^+\backslash s[a-z']^+$		
$[aeiou]..$		
$[^A-Za-z]^+$		
$(super)?(cool dumb evil)$		
$[\emptyset-9]\{5\}-[\emptyset-9]\{4\}$		