Section 1: Regular Expressions

Regular Expression Reference Table

Symbol	Meaning	Example(s)
a	Literal character	a, any symbol in your alphabet Σ
ab	Concatenation of regex's (or literal characters) a and b	ab, $(abc)(def)$
ε	Empty string	ε
a|b	a or b	a, b
a^*	0 or more a's	$\varepsilon, a, aaaa, aaaaa$
a+	1 or more a's	$a, aaa, aaaaa$
a?	0 or 1 a's	ε, a
[a-z]	1 character in range a-z: $(a \mid b \mid ... \mid z)$	a, b, c, d, e, f, ..., z
[skj]	1 of characters in bracket: $(s \mid k \mid j)$	s, k, j

1) Describe the meaning of each of the following regular expressions in English and give two different strings it can produce:

    i)   (1 | 0)* 0

    ii)   ([A-Z][a-z]* | [0-9]+)

    iii)   (ε | 4?0+1* X 3+)

2) Write a regular expression for each of the following specifications:

    i)   All strings consisting of 0's and 1's (binary digits) with an even number of 0s

    ii)   camelCase variable name in Java, where the alphabet contains is upper and lower-case letters no digits or underscores

    iii)   Non-empty strings of binary digits where each 1 directly follows a 0 (challenge: only use symbols in table up until *)