Give regular expressions for each of the following languages over the alphabet $\{0, 1\}$.

1   All strings containing the substring 000.

2   All strings *not* containing the substring 000.

3   All strings in which every run of 0s has length at least 3.

4   All strings in which 1 does not appear after a substring 000.

5   All strings containing at least three 0s.

6   Every string except 000. (**Hint:** Don't try to be clever.)

Work on these later:

7   All strings w such that *in every prefix of w*, the number of 0s and 1s differ by at most 1.

8   (**Hard.**) All strings containing at least two 0s and at least one 1.

9   (**Hard.**) All strings w such that *in every prefix of w*, the number of 0s and 1s differ by at most 2.

10   (**Really hard.**) All strings in which the substring 000 appears an even number of times.
        (For example, 0001000 and 0000 are in this language, but 00000 is not.)