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

1. All strings containing the substring 000.
2. All strings \textit{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. \textbf{(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. \textbf{(Hard.)} All strings containing at least two 0s and at least one 1.
9. \textbf{(Hard.)} All strings \(w\) such that in every prefix of \(w\), the number of 0s and 1s differ by at most 2.
10. \textbf{(Really hard.)} All strings in which the substring 000 appears an even number of times.
    \hfill (For example, 0001000 and 0000 are in this language, but 00000 is not.)