In-class Practice 9: Regular Languages

Consider the language M of all binary strings with equal numbers of 0's and 1's.

(a) Provide an infinite set of strings that are pairwise distinguishable with respect to M.

For example, $\{\varepsilon, 0, 00, 000, 0000, \ldots\}$

(b) Provide an infinite set of strings that are pairwise indistinguishable with respect to M.

For example, $\{\varepsilon, 01, 0011, 000111, \ldots\}$

(c) Is the complement of M regular or not? Justify your answer.

No. Regular languages are closed under complementation.