Exercise

A population is divided in two group: the sick S and the not sick NS. We know that that $P(S) = 0.01$. A test can determine whether the person x is or is not in S but it is not absolutely sure. We have:

$$P(\{ \text{ test positive } \} \mid S) = 0.99$$
$$P(\{ \text{ test negative } \} \mid S') = 0.98$$

To have a better test we use the following procedure: choosen a person x we repeat the test till we find two consecutive results that are equal. Write a code to compute:

$$P(S \mid \{ \text{ procedure positive } \}) = ?$$
$$P(S' \mid \{ \text{ procedure negative } \}) = ?$$

How many time you should repeat ther test, in the average?