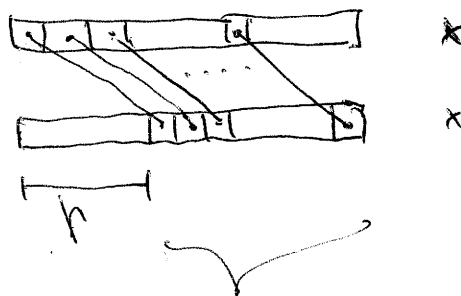


# Periods

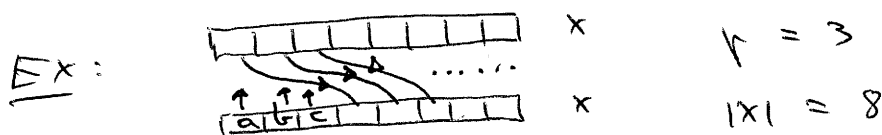
Period of string  $x$  is integer  $p$  ( $0 < p \leq |x|$ ) s.t.

$$x[i] = x[i+p] \quad i=1, 2, \dots, |x|-p$$



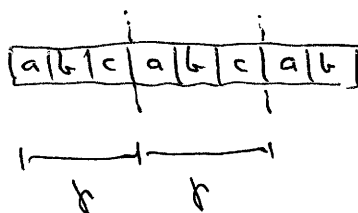
Note 1: period  $p \sim$  border of length  $|x|-p$  ~~(non-trivial)~~ (border as  $p \geq 1$ )

Note 2: If a string has a period  $p$ , then  $x$  is a (truncated) repetition of  $x[1..p]$



$x[1..p]$

We see that  $x$  must be:



This string is sometimes also called a period

Def.:  $\text{period}(x) =$  the smallest period of  $x$ .

( $|x|$  is always a period, so this is well defined).