Jutge.org

The Virtual Learning Environment for Computer Programming

Sliding window 1 X38951_en

Recall that a string (genomic sequence) can be split in words of length 3 (codons) by sliding a window of size 3 over the string, with a step size of 3. More in general, a string can be split in overlapping words of length x and overlap size $x - y$ by sliding a window of size x and step size y over the string. For example, sliding a window of size 3 and step size 2 over the string TATAAT gives the overlapping words TAT and TAA.

Write code for the sliding window problem. The program must implement and use the SLIDING-WINDOW function in the pseudocode discussed in class, which is iterative and is not allowed to perform input/output operations. Make one submission with Python code and another submission with C++ code.

Input

The input is a string s over the alphabet $\Sigma = \{A, C, G, T\}$, an integer x (the window size), and an integer y (the step size).

Output

The output is all substrings of s of size x starting at positions $1, 1 + y, 1 + 2y, \ldots$

Sample input 1	Sample output 1
ACGGTAGACCT 3 1	ACG CGG GGT GTA TAG AGA GAC ACC CCT

Sample input 2	Sample output 2
ACGGTAGACCT 3 3	ACG GTA GAC

Sample input 3	Sample output 3
ACGGTAGACCT 3 5	ACG AGA

Sample input 4	Sample output 4
ACGGTAGACCT 5 2	ACGGT GGTAG TAGAC GACCT

Hint

Notice that there are no "partial" substrings of s (of size smaller than x) in the output.

Problem information

Author : Gabriel Valiente
Generation : 2022-07-07 18:29:14