
Sliding window 2 X99827_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 recursive 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 (a genomic sequence) 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

```
ACGGTAGACCT
3
1
```

Sample output 1

```
ACG
CGG
GGT
GTA
TAG
AGA
GAC
ACC
CCT
```

Sample input 2

```
ACGGTAGACCT
3
3
```

Sample output 2

```
ACG
GTA
GAC
```

Sample input 3

```
ACGGTAGACCT
3
5
```

Sample output 3

```
ACG
AGA
```

Sample input 4

```
ACGGTAGACCT
5
2
```

Sample output 4

```
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
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