

**Problem 8.** The four adjacent digits in the 1000-digit number that have the greatest product are  $9 \times 9 \times 8 \times 9 = 5832$ .

```

73167176531330624919225119674426574742355349194934
96983520312774506326239578318016984801869478851843
85861560789112949495459501737958331952853208805511
12540698747158523863050715693290963295227443043557
66896648950445244523161731856403098711121722383113
62229893423380308135336276614282806444486645238749
30358907296290491560440772390713810515859307960866
70172427121883998797908792274921901699720888093776
65727333001053367881220235421809751254540594752243
52584907711670556013604839586446706324415722155397
53697817977846174064955149290862569321978468622482
83972241375657056057490261407972968652414535100474
82166370484403199890008895243450658541227588666881
16427171479924442928230863465674813919123162824586
17866458359124566529476545682848912883142607690042
24219022671055626321111109370544217506941658960408
07198403850962455444362981230987879927244284909188
84580156166097919133875499200524063689912560717606
05886116467109405077541002256983155200055935729725
71636269561882670428252483600823257530420752963450

```

Find the thirteen adjacent digits in the 1000-digit number that have the greatest product. What is the value of this product?

**Knowledge required:** None

**Solution Outline:** We are asked to find the maximum product of all sub-strings in the given text of size 13. We begin by implementing a generalized function called `max_prod_text` which takes in `lookaheads` (13 in this case) and returns the maximum product sum of all sub-strings of size `lookaheads`.

We start by initializing the variable `max_prod` to 1. Then we compute all the product of substrings of size `lookaheads` and update the `max_prod` for each such substring. Finally, `max_prod` contains the final answer.

## Python Solution

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```
1 TEXT = "COPY PASTE THAT HUGE WALL OF TEXT GIVEN IN THE PROBLEM HERE"
2
3 def max_prod_text(lookaheads):
4     max_prod = 1
5     for i in range(len(TEXT) - lookaheads + 1):
6         curr_product = 1
7         for j in range(i, i + lookaheads):
8             curr_product *= int(TEXT[j])
9         max_prod = max(max_prod, curr_product)
10
11     return max_prod
12
13 print(max_prod_text(13))
```

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