# Problem 4 – Nakovs Matching

We are given two words **a** and **b**. Each word can be split in several ways into left and right side:

* **a = (aLeft|aRight)**
* **b = (bLeft|bRight**)

The weight **w(s)** of given character sequence **s** is calculated as **sum of the ASCII codes** of its characters. The **Nakov's distance** between two split words **(aLeft|aRight)** and **(bLeft|bRight**) is defined as:

* **nakovs = w(aLeft) \* w(bRight) - w(aRight) \* w(bLeft)**, as absolute value

We assume that two word splits have **good matching** if their Nakov's difference is not greater than given limit number **d**. Your task is to write a program that prints all good matchings between given two words **a** and **b** and given limit number **d**.

Example: **a** = "**hello**", **b** = "**csharp**", **d** = **20000**. The word **a** can be split in 4 ways: "**h|ello**", "**he|llo**","**hel|lo**" and "**hell|o**". The word **b** can be split in 5 ways: "**c|sharp**", "**cs|harp**", "**csh|arp**", "**csha|rp**" and "**cshar|p**". There are 20 possible matchings between the words **a** and **b**, but only 3 of them are good matchings (**nakovs ≤ d**):

|  |  |
| --- | --- |
| (h|ello) matches (c|sharp) by 13996 nakovs | w(h) = 104, w(ello) = 428, w(c) = 99, w(sharp) = 542  nakovs = abs(104 \* 542 - 428 \* 99) = **13996** ≤ 20000 |
| (he|llo) matches (cs|harp) by 17557 nakovs | w(he) = 205, w(llo) = 327, w(cs) = 214, w(harp) = 427  nakovs = abs(205 \* 427 - 327 \* 214) = **17557** ≤ 20000 |
| (hell|o) matches (cshar|p) by 11567 nakovs | w(hell) = 421, w(o) = 111, w(cshar) = 529, w(p) = 112  nakovs = abs(421 \* 112 - 529 \* 111) = **11567** ≤ 20000 |

Your task is to write a program that **enters a, b and d** and prints on the console **all good matchings** between **a** and **b**.

### Input

The input data should be read from the console. It consists of 3 lines:

* The first line hold the **first string**.
* The second line holds the **second string**.
* The third line holds the **limit number** **d**.

The input data will always be valid and in the format described. There is no need to check it explicitly.

### Output

Print on the console **all good matchings** between these two words in format "**(aLeft|aRight) matches (bLeft|bRight) by XXX nakovs**", each at separate line. The **order** of the output lines is not important. Print "**No**" if no good matchings are found.

### Constraints

* The input words **a** and **b** consist of small Latin letters only. The **length** of the words is in the range [2…20].
* The number **d** is integer in the range [0…5 000 000].
* Allowed working time: 0.25 seconds. Allowed memory: 16 MB.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| hello  csharp  20000 | (h|ello) matches (c|sharp) by 13996 nakovs  (he|llo) matches (cs|harp) by 17557 nakovs  (hell|o) matches (cshar|p) by 11567 nakovs | nice  exam  100 | (ni|ce) matches (ex|am) by 90 nakovs |