String Generator

Write a program that generates a string based on the algorithm described below. First, a number `n` is randomly selected, which is a natural number in the range <10, 40>. This number represents the length of the generated string. The next character is randomly selected from the range of characters <A, Z>. The selected character can only be appended to the resulting string if it has occurred fewer than `m` times so far (where `m` is a natural number randomly chosen from the range <1, 3>). Otherwise, the character selection must be repeated.

For the generated string, perform the following tasks:

1. **Identify the character with the largest sum of distances between its occurrences.**
   By the sum of distances, we mean the number of positions in the string between the first and second occurrences and, if applicable, the number of positions between the second and third occurrences. If the character appears only once in the string, we assume the result is 0.
2. **For the chosen character (if it appears in the string), determine the minimum total number of positions its occurrences need to be shifted to move all of them to the beginning of the string as the first characters.**
3. **Generate a new string based on the original string, which we will call the symmetric string.**
   The symmetric string at the `i`-th position contains a character that has the same difference in its numerical code from the character `A` as the difference between the character at the `i`-th position in the original string and the character `Z`.