Security Key Generation Algorithm

The Central Bureau of Investigation (CBI) is tasked with handling highly sensitive and classified information that must be exchanged securely over the internet. Given the critical nature of their work, the need for robust security protocols is paramount to protect data integrity and confidentiality during transmission.

To enhance security, the CBI team requires a custom algorithm for generating security keys used to encrypt and decrypt files. This algorithm will be based on specific rules for splitting words into three parts and combining them in a predefined manner.

Problem Statement

Develop a "Security Key Generation Algorithm" for the CBI team that ensures secure information exchange over the internet. This algorithm should generate a unique security key based on the following word-splitting and combination rules:

1. **Word Splitting Rules:**
    - If the word length is 3 or less, each part will have one letter.
    - If the word length can be divided equally into three parts, each part will have the same number of letters.
    - If the word length cannot be divided equally into three parts, the middle part (Part 2) will get the extra number of characters.
2. **Key Generation Process:**
    - Input two words (Word1 and Word2).
    - Split each word into three parts using the above rules.
    - Form the security key by combining the parts in the following order:
        - First part of Word2
        - First part of Word1
        - Third part of Word1
        - Third part of Word2

Password = first part of word 2 + first part of word1 + third part of word1 + third part of word 2

Constraints: Implement the "Security Key Generation Algorithm" in a programming language of your choice. Ensure the algorithm:

- Accepts two input words.
- Splits the words according to the defined rules.
- Combines the parts in the specified order to generate the security key.
- Returns the generated security key for use in encrypting and decrypting files.

Examples

- **Example 1:**
  - **Input:** Word1 = "WIPRO", Word2 = "TECHNOLOGIES"
  - **Splitting:**
    - Word1: "W", "IPR", "O"
    - Word2: "TECH", "NOLO", "GIES"
  - **Output Security Key:** "TECHWOGIES"
- **Example 2:**
  - **Input:** Word1 = "MACHINE", Word2 = "LEARNING"
  - **Splitting:**
    - Word1: "MA", "CHI", "NE"
    - Word2: "LE", "ARNI", "NG"
  - **Output Security Key:** "LEMANENG"

User-ID Generation for an Online Gaming Competition

Joseph's team has been assigned the task of creating user-ids for all participants of an online gaming competition Joseph has designed a process for generating the user-d using the participant's First_Name ,Last_Name, PIN code and a number N The process defined by Joseph is as below –

Step1- Compare the lengths of First_Name and Last_Name of the participant. The one that is shorter will be called “Smaller Name” and the one that is longer will be called the “longer Name” if both First_Name and Last_Name are of equal Length ,then the name that appears earlier in alphabetical order will be called “Smaller Name” and the name that appears later in alphabetical order will be called the “Longer Name”

Step2 - The user-should be generated as below –

Last Letter of the smaller name + Entre word of the longer name + Digit at position N in the PIN when traversing PIN from left to right +Digit at position N in the PIN when traversing the PIN from right to left

Step3 - Toggle the alphabets of the user-id generated in step -2 i.e. upper-case alphabets should become lower-case and lower-case alphabets should become upper-case.

Example

First Name = Rajiv

Last Name =Roy

PIN = 560037

N= 6

Step1 - Length of Last_Name is less than the Length of First_Name, so the Smaler Name is “Roy” and the Longer Name is “Rajiv”

Step2 - The user id will be = Last Letter of the smaller name +Entre word in the longer name + Digit at position N in the PIN when traversing the PIN from left to right +Digit at position N in the PIN when traversing the PIN from right to left

=Last Letter of “Roy”+ Entre word in Rajiv+ 6th Digit of Pin from left + 6th Digit of PIN from right

=y+ Rajiv+7+5 (Therefore, user-id=yRajiv75)

Step3 -Toggle the alphabet in the user-id. **So,user-id = YrAJIV75**