Hail Caesar!

In cryptography, a Caesar cipher, also known as Caesar's cipher, the shift cipher, Caesar's code or Caesar shift, is one of the simplest and most widely known encryption techniques. It is a type of substitution cipher in which each letter in the plaintext is replaced by a letter some fixed number of positions down the alphabet. For example, with a left shift of 3, D would be replaced by A, E would become B, and so on. The method is named after Julius Caesar, who used it in his private correspondence.

Example

The transformation can be represented by aligning two alphabets; the cipher alphabet is the plain alphabet rotated left or right by some number of positions. For instance, here is a Caesar cipher using a left rotation of three places, equivalent to a right shift of 23 (the shift parameter is used as the key):

Plain: ABCDEFGHIJKLMNOPQRSTUVWXYZ

Cipher: XYZABCDEFGHIJKLMNOPQRSTUVW

When encrypting, a person looks up each letter of the message in the "plain" line and writes down the corresponding letter in the "cipher" line.

Plaintext: THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG

Ciphertext: QEB NRFZH YOLTK CLU GRJMP LSBO QEB IXWV ALD

Deciphering is done in reverse, with a right shift of 3.

The encryption can also be represented using modular arithmetic by first transforming the letters into numbers, according to the scheme, A → 0, B → 1, ..., Z → 25.[2] Encryption of a letter x by a shift n can be described mathematically as,

En (x) = (x + n) mod 26

Decryption is performed similarly,

Dn (x) = (x - n) mod 26

Assignment:

Write a console application in C# and in Java to implement a Caesar Cipher. The user is presented with a menu with two items:

1. Encrypt
2. Decrypt

Once the user selects a menu item then the program prompts them to enter a number representing the amount of the shift and a text string to either encrypt or decrypt.

Your solutions should include unit tests, so you’ll need to implement your encryption and decryption routines as public methods in your main class.

Tasks:

1. Create a Github repo named caesar-cipher.
2. Clone your repo in a folder on your local machine.
3. Create a branch called caesar-cipher-csharp
4. Create your solution in C#
5. Push your branch up to Github
6. Generate a Pull Request
7. When pull request is merged, the C# solution is complete
8. Repeat steps 1-7 for Java