Question - 1
CO253 Programming Project Milestone 02

In this milestone, you have to implement encryption and decryption functions.

If the input is the message, then it has to be encoded to its equivalent binary representation and then encrypted, and if the input is the bit sequence, the sequence has to be decrypted first and then decoded to the corresponding message.

You have already implemented functions to encode a message to bit sequence and decode the bit sequence into the message. You have to use those 2 functions along with new functions you are creating to obtain the outputs. (See the project specification document for the explained encryption and decryption algorithms.)

What we expect you to do is to implement 2 functions with the following signatures:

char* encrypt(int n, int k, char* bitsq); // n is the length of message and k is the number of shifts
char* decrypt(int l, int k, char* encryptedBitsq); // l is the length of bit sequence and k is the number of shifts

Then write the **main function** to take the following inputs and produce the said outputs.

Inputs

- First line contains a char[C or P] which indicates whether you are getting Message/Plain text(if P) or Bit sequence(if C)
- Next line contains 2 or 3 space-separated integers.
1. If you get P previously, you will get 2 integers N and k where N is the length of the message and k is the number of shifts.
2. If you get C previously, you will get 3 integers N, L and k where N is the length of the message(original message in this case output), L is the length of the receiving bit sequence and k is the number of shifts.
- The next line contains a string.
1. It should be considered as the Message(Plain text) if you got P in the first line and you need to encode it and then encrypt it.
2. If you got C then it is the Encrypted bit sequence which required to be decrypted first and then decoded to get the message.

Constraints

Length of message < 1000
Length of bit sequence < 10000
Number of shifts < 1000

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1/3

Output

- If you got Plain text as the input you have to output the encrypted bit sequence.
- If you got the encrypted bit sequence as the input you should output the message.

Explanation

Input:
P
2 3
Hi

'H' ascii value = 72								'i' ascii value = 105						
0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1

0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1			Shift 0
	0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1		Shift 1
		0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1	Shift 2
0	1	1	1	1	1	1	0	0	1	0	0	0	1	1	1	1	1	Encrypted message

↓

XOR (1, 1, 0) = 0

Input:
C
2 18 3
011111100100011111

0	1	1	1	1	1	1	0	0	1	0	0	0	1	1	1	1	1	Encrypted message
0																		Shift 0
	0																	Shift 1
		0																Shift 2

0	1	1	1	1	1	1	0	0	1	0	0	0	1	1	1	1	1	Encrypted message
0	1																	Shift 0
	0	1																Shift 1
		0	1															Shift 2

↓

XOR (1, 0) = 1

0	1	1	1	1	1	1	0	0	1	0	0	0	1	1	1	1	1	Encrypted message
0	1	0																Shift 0
	0	1	0															Shift 1
		0	1	0														Shift 2

↓

XOR (1, 1, 0) = 0   Continue until all bits are found

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
0	1	1	1	1	1	1	0	0	1	0	0	0	1	1	1	1	1	Encrypted message
0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1			Shift 0
	0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1		Shift 1
		0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1	Shift 2

0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	1
ascii value = 72								ascii value = 105							
H								i							