**COMSAT UNIVERSITY ISLAMABAD ATTOCK CAMPUS**

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**INFORMATION SECURITY**

**NAME:** MUHAMMAD USMAN SIDDIQUE

**REGISTRATION NO:** SP24-BSE-024

**SUBMITTED TO:** Ms. AMBAREEN GUL

**DEPARTMENT:** SOFTWARE ENGINEERING

**DATE:** 14th October 2025

**Lab work**

**Task 1**

Perform following tasks for following Transposition Cipher code.

(Alphabet Number \* key) mod (total number of alphabets

def split\_len(seq, length):

return [seq[i:i + length] for i in range(0, len(seq), length)]

def encode(key, plaintext):

order = {

int(val): num for num, val in enumerate(key)

}

ciphertext = ''

for index in sorted(order.keys()):

for part in split\_len(plaintext, len(key)):

try:

ciphertext += part[order[index]]

except IndexError:

pass

return ciphertext

print(encode('3214', 'HELLO'))

**1) Handle Different Key Sizes**

Modify the encode function to handle cases where the length of the key is not equal to the length of the plaintext. Task: Add padding to the plaintext when it is shorter than the key.

**2) Decode Function**

Create a decode function that reverses the encode process. Task: Write a function decode(key, ciphertext) that deciphers the encrypted message and returns the original plaintext.

**3) Support for Uppercase and Lowercase Letters**

Modify the code to preserve the original case (uppercase and lowercase letters) in the **plaintext.**

**Task 2**: Adjust the encode function to handle both uppercase and lowercase letters, so it doesn’t always convert to lowercase.

**4) Encrypt Full Sentences with Spaces**

Modify the encode function to handle spaces and punctuation without removing them.

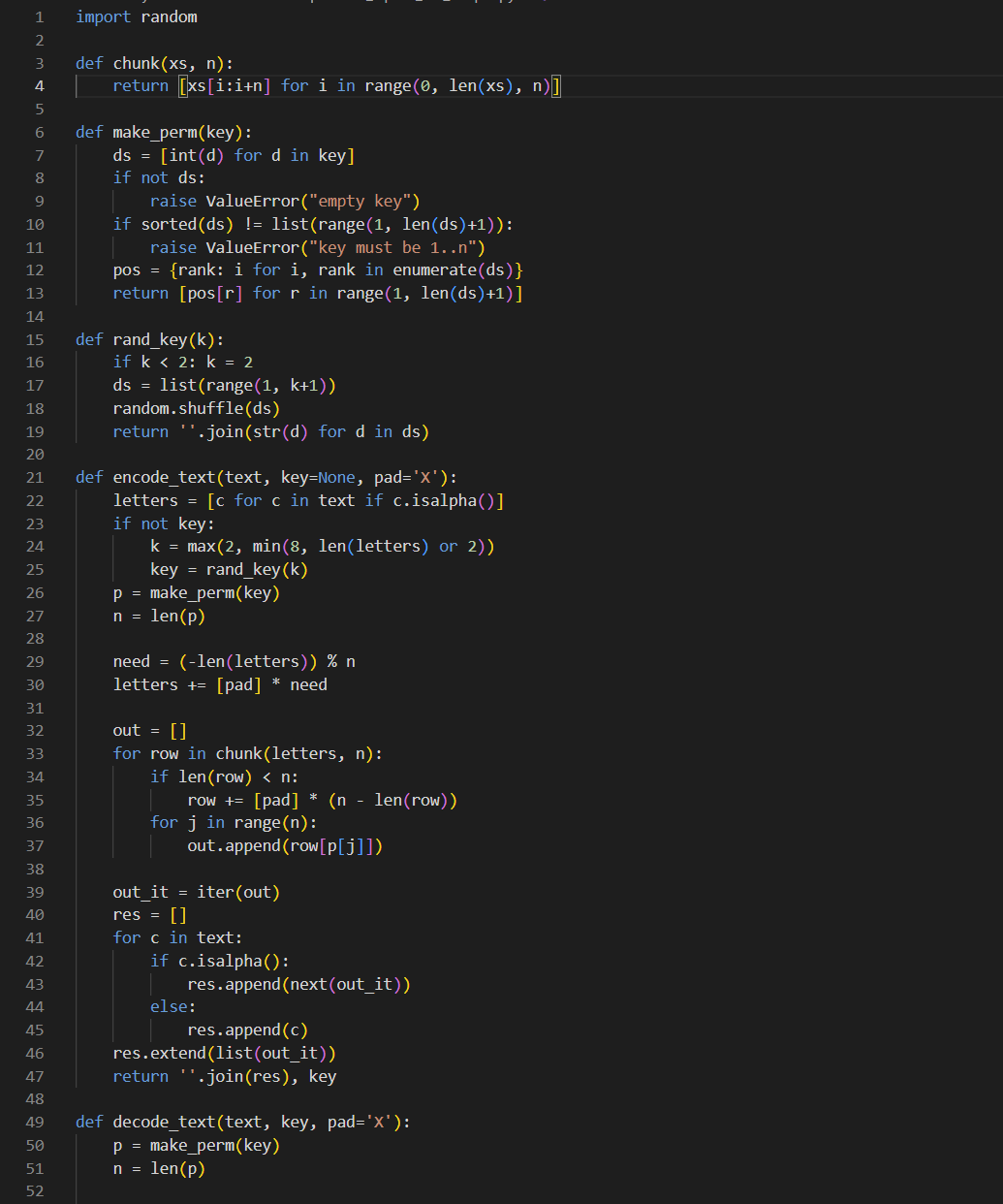
Task: Ensure that spaces and punctuation are preserved and not encrypted when encoding full sentences.

**5) Dynamic Key Generation**

Automatically generate a random key if the user does not provide one. Task: Write a function that generates a random key based on the length of the plaintext.

**6) Add a Menu Interface**

Create a simple command-line interface where the user can choose to encode or decode a message. Task: Write a menu system where the user can input a choice to either encode, decode, or exit.

**Solution Code: A screen shot of a computer program

AI-generated content may be incorrect.**

**Output Code: A screenshot of a computer program

AI-generated content may be incorrect.**