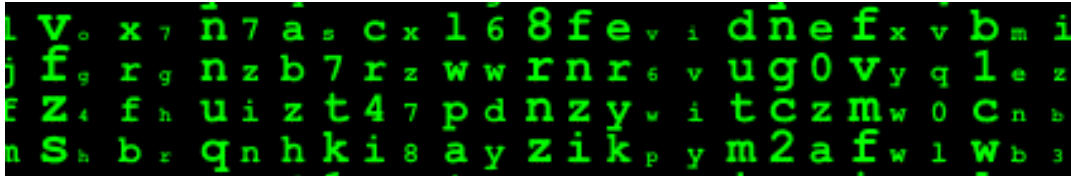


Cryptography Challenge

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Cryptography, or cryptology is the practice and study of techniques for secure communication. Cryptography relies on using more or less complex encryption algorithms to encode a readable message (plaintext) into a collection of characters (ciphertext) that is hard to decipher (decode).



For this challenge, we are giving you a piece of Python code used to encrypt a message. See below.

The Python Code

```
#Cryptography Challenge #1

import random, time

#A basic encryption algorithm...

def encrypt(plaintext, key):

    alphabet = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ"

    ciphertext = ""

    for i in range(0,len(plaintext)):

        character = plaintext[i]

        ciphertext = ciphertext + character

        for j in range (0,key):

            ciphertext = ciphertext + random.choice(alphabet)

    return ciphertext
```

```
#Main program starts here...

#Input...

plaintext = input("Enter a message to encrypt (plaintext)")
key = int(input("Input a key as a number between 1 and 10"))
while not (key>=1 and key<=10):
    print("Invalid key, try again!")
    key = int(input("Input a key as a number between 1 and 10"))

#Process...

print("...")
time.sleep(1)
print("Encrypting plaintext...")
time.sleep(1)
print("...")
time.sleep(1)
ciphertext = encrypt(plaintext, key)

#Output...

print("Ciphertext:")
print(ciphertext)
```

The Challenge

Your first task is to **reverse-engineer** this code to understand how this encryption algorithm works.

Then, your challenge consists of writing a new function called **decrypt()**, that takes two parameters (a **ciphertext** and a **key**) and returns the **plaintext** corresponding to the given ciphertext.

Update the table below with the answers obtained from your `decrypt()` function.

Decryption Table

Using your new **decrypt()** function, decrypt the following messages:

Sn	Cipher Text	Key	Plaintext
1.	YFwoJeELOvIDVrOINBDConouLwhdCC mkljsYeKsuaGsDbSRJymLJVOaYNQRrgKBSifPOdnCbUleWCbf	4	
2.	HNABntvVepMaQSNHyKxQTXZf HVbQXcqJSXfswOAuRBzpefOdfBeylimeqDHDIFc	7	
3.	PqKgakYBpfzveAHVrrUgbzpkamWUcscukxac QfsWpFSrTrwiaQRtSsXesGlrBqv	3	
4.	HXelrEed fCxojmVersu Gtehvee NSluGnJ	1	
5.	PHcRrveeRUmDnfqMFAnBJvvwyZSDrj tqXhrLRXlegaDLwdInIGCvqelcjzU	5	
6.	CaLbsilDbelGGgb RbbSAWPZgcOsdVavldSdxxfVeHQtmJxDfyCYwo	4	
7.	pcxzGsKfyLKdZRObtAwohNmWhlbFnIJiofcYDeWjnNOFpdYUiqeLVqcKsUXJWeYttITQzGpFaILWQkRU!BwhehCh	7	

Example Run

```
λ py cypher1.py
Enter a message to decrypt (cipher text): CbrlJfrpzowMyXvsPppnLcKQtjXiKEolRjWqGovZorANVrlafCJpopLUqochwpzizyElCBr gMiXCCHdfAjhbcOAFaifuVHlTPMQz1JwoDieiGbmnoqVQrSgHQcPoenNbEC
Input a key as a number between 1 and 10: 5
...
Decrypted Text: Cryptography Challenge
```