

Lab02 Submission

Details :

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- SRN : PES2UG20CS237
- Section : D

🔗 Question 1 :

```
[18:32:44] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*)>>> cat PES2UG20CS237.txt
EXCITED ABOUT HIS NEWLY-EARNED POWERS, MIDAS STARTED TOUCHING every
surrounding objects like stones, grass, trees and cart, TURNING EACH ITEM INTO PURE
GOLD. BUT SOON, MIDAS BECAME HUNGRY. AS HE PICKED UP A PIECE OF FOOD, HE
FOUND HE COULD NOT EAT IT. IT HAD TURNED TO GOLD IN HIS HAND.
[18:32:45] [cost 0.034s] cat PES2UG20CS237.txt

[18:32:46] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*)>>> █
```

Question 2 :

Frequencies :

```
he 3
h 10
ed 5
oo 2
a 15
as 4
```

```
>>> file_content = open("PES2UG20CS237.txt", "r").read()
>>> open("PES2UG20CS237.txt", "w").write(file_content.lower())
287
>>> file_content = open("PES2UG20CS237.txt", "r").read()
>>> file_content.count("he")
3
>>> file_content.count("h")
10
>>> file_content.count("ed")
5
>>>
>>> file_content.count("oo")
2
>>> file_content.count("a")
15
>>> file_content.count("as")
4
>>> █
```

Question 3 :

```
[18:41:58] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*)>>> cat PES2UG20CS237.txt | grep -e he -e h -e ed -e oo -e a -e aa
excited about his newly-earned powers, midas started touching every
surrounding objects like stones, grass, trees and cart, turning each item into pure
gold. but soon, midas became hungry. as he picked up a piece of food, he
found he could not eat it, it had turned to gold in his hand.
[18:42:15] [cost 0.039s] cat PES2UG20CS237.txt | grep -e he -e h -e ed -e oo -e a -e aa
```

Question 4 :

```
Python 3.7.0 (default, Aug 10 2022, 14:37:11)
[GCC 12.1.1 20220730] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> from util import *
>>> generate_key('abcdefghijklmnopqrstuvwxyz')
'syvncxijoumaqzbeghkwflrdtp'
>>> █
```

Substitution Key : `syvncxijoumaqzbeghkwflrdtp`

Question 5 :

Plain text :

excited about his newly-earned powers, midas started touching every surrounding objects like stones, grass, trees and cart, turning each item into pure gold. but soon, midas became hungry. as he picked up a piece of food, he found he could not eat it. it had turned to gold in his hand.

Encrypted text :

cdvowcn sybfw jok zcrat-cshzcn ebrchk, qonsk kwshwcn wbfvjozi clcht kfhhbfznozi byucvkw aomc kwbzck, ihskk, whcck szn vshw, wfhzozi csvj owcq ozwb efhc iban. yfw kbbz, qonsk ycvsvc jfziht. sk jc eovmcn fe s eocvc bx xbbn, jc xbfzn jc vbfan zbw csw ow. ow jsn wfhzcn wb iban oz jok jszn.

```
python3
>>> from util import *
>>> encrypt("PES2UG20CS237","syvncxijoumaqzbeghkwflrdtp")
cdvowcn sybfw jok zcrat-cshzcn ebrchk, qonsk kwshwcn wbfvjozi clcht
kfhhbfznozi byucvkw aomc kwbzck, ihskk, whcck szn vshw, wfhzozi csvj owcq ozwb efhc
iban. yfw kbbz, qonsk ycvsvc jfziht. sk jc eovmcn fe s eocvc bx xbbn, jc
xbfzn jc vbfan zbw csw ow. ow jsn wfhzcn wb iban oz jok jszn.
>>> █
```

Question 6 :

```
[19:13:43] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*) python3
Python 3.7.0 (default, Aug 10 2022, 14:37:11)
[GCC 12.1.1 20220730] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> from util import *
>>> encrypt("PES2UG20CS237","syvncxijoumaqzbeghkwflrdtp")
cdvowcn sybfw jok zcrat-cshzcn ebrchk, qonsk kwshwcn wbfvjozi clcht
kfhhbfznozi byucvkw aomc kwbzck, ihskk, whcck szn vshw, wfhzozi csvj owcq ozwb efhc
iban. yfw kbbz, qonsk ycvsvc jfziht. sk jc eovmcn fe s eocvc bx xbbn, jc
xbfzn jc vbfan zbw csw ow. ow jsn wfhzcn wb iban oz jok jszn.

>>> decrypt("PES2UG20CS237","syvncxijoumaqzbeghkwflrdtp")
excited about his newly-earned powers, midas started touching every
surrounding objects like stones, grass, trees and cart, turning each item into pure
gold. but soon, midas became hungry. as he picked up a piece of food, he
found he could not eat it. it had turned to gold in his hand.

>>> █
```

Question 7 :

```
[19:15:55] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*)>>> touch new_text.txt
[19:16:01] [cost 0.033s] touch new_text.txt

[19:16:01] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*)>>> cat > new_text.txt
Hungry, Midas groaned, "I'll starve! Perhaps this was not such an excellent wish after
all!"...
[19:16:17] [cost 9.768s] cat > new_text.txt

[19:16:39] [~/github/UE20CS30X-Submissions/CRYPTO/SUBMISSION-2] git:(main*)>>> █
```

```
>>> encrypt("new_text","syvncxijoumaqzbeghkwflrdtp")
Hfziht, Monsk ihbscn, "I'aa kwshlc! Pchjsek wjok rsk zbw kfvi sz cdvcaaczw rokj sxwch
saa!"...

>>> decrypt("new_text","syvncxijoumaqzbeghkwflrdtp")
Hungry, Midas groaned, "I'll starve! Perhaps this was not such an excellent wish after
all!"...

>>> █
```

Observation : All the double quotes not being part of alphabet remain unencrypted, More over not converting to lower case keeps it unchanged in the cipher text

Code used for all of the above excersises :

```
def check_key_validity ( key , alphabet ) :
    if len ( key ) != len ( alphabet ) :
        return False
    if len ( list ( key ) ) != len ( set ( key ) ) :
        return False
    return True

def generate_key ( alphabet_string ) :
    import random as r
    l = list ( alphabet_string )
    r.shuffle ( l )
    return ''.join ( l )

def encrypt(srn, key):
    fd = open(srn+".txt", "r")
    file_content = str(fd.read())
    fd.close()
    alphabet = "abcdefghijklmnopqrstuvwxyz"
    cipher_text = ''

    for i in range(0, len(file_content)):
        letter = file_content[i]
        if letter not in alphabet:
            cipher_text += letter
        else:
            cipher_text += key[alphabet.index(letter)]
    fd = open(srn+"_enc.txt", "w+")
    fd.write(str(cipher_text))
```

```
fd = open(srn+"_enc.txt", "r")
print(fd.read())
return

def decrypt(srn, key):
    fd = open(srn+"_enc.txt", "r")
    file_content = str(fd.read())
    fd.close()
    alphabet = "abcdefghijklmnopqrstuvwxyz"
    plain_text = ""

    for i in range(0, len(file_content)):
        letter = file_content[i]
        if letter not in key:
            plain_text += letter
        else:
            plain_text += alphabet[key.index(letter)]
    fd = open(srn+"_dec.txt", "w+")
    fd.write(str(plain_text))
    fd = open(srn+"_dec.txt", "r")
    print(fd.read())
    return
```
