

## Assignment – 9

### 1. Ceaser Cipher

```
def encrypt_text(plaintext,n):
    ans = ""
    # iterate over the given text
    for i in range(len(plaintext)):
        ch = plaintext[i]

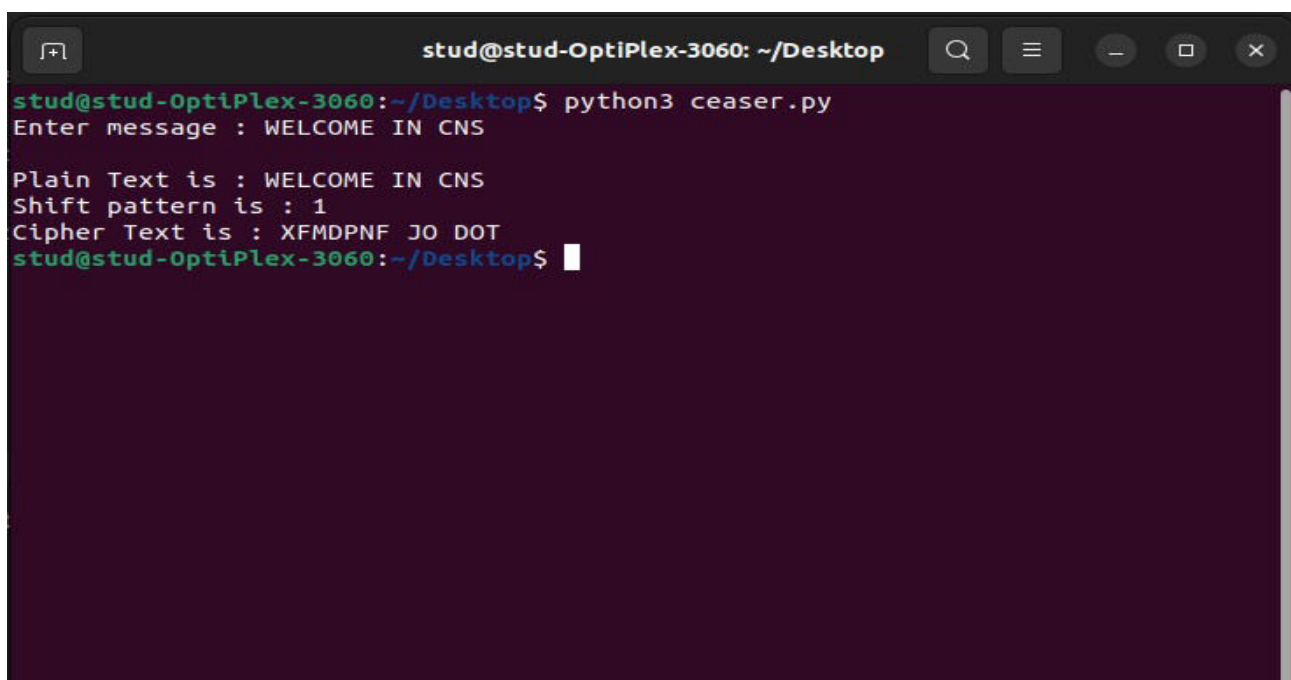
        if ch==" ":
            ans+=" "

        elif (ch.isupper()):
            ans += chr((ord(ch) + n-65) % 26 + 65)

        else:
            ans += chr((ord(ch) + n-97) % 26 + 97)

    return ans

plaintext = input("Enter message : ")
n = 1
print("\nPlain Text is : " + plaintext)
print("Shift pattern is : " + str(n))
print("Cipher Text is : " + encrypt_text(plaintext,n))
```

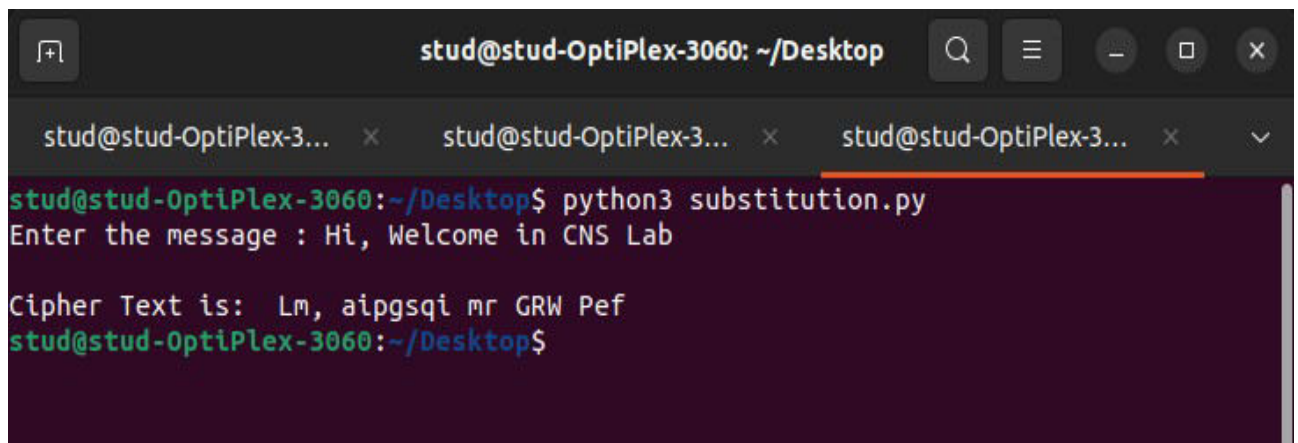
A terminal window with a dark background and light-colored text. The window title is 'stud@stud-OptiPlex-3060: ~/Desktop'. The prompt is 'stud@stud-OptiPlex-3060:~/Desktop\$'. The user has entered 'python3 ceaser.py'. The program output is: 'Enter message : WELCOME IN CNS', 'Plain Text is : WELCOME IN CNS', 'Shift pattern is : 1', and 'Cipher Text is : XFMDPNF JO DOT'. The prompt is now 'stud@stud-OptiPlex-3060:~/Desktop\$' with a cursor.

```
stud@stud-OptiPlex-3060: ~/Desktop
stud@stud-OptiPlex-3060:~/Desktop$ python3 ceaser.py
Enter message : WELCOME IN CNS

Plain Text is : WELCOME IN CNS
Shift pattern is : 1
Cipher Text is : XFMDPNF JO DOT
stud@stud-OptiPlex-3060:~/Desktop$
```

## 2. Substitution Cipher

```
import string
all_letters= string.ascii_letters
dict1 = {}
key = 4
for i in range(len(all_letters)):
    dict1[all_letters[i]] = all_letters[(i+key)%len(all_letters)]
plain_txt= input("Enter the message : ")
cipher_txt=[]
for char in plain_txt:
    if char in all_letters:
        temp = dict1[char]
        cipher_txt.append(temp)
    else:
        temp =char
        cipher_txt.append(temp)
cipher_txt= "".join(cipher_txt)
print("\nCipher Text is: ",cipher_txt)
dict2 = {}
for i in range(len(all_letters)):
    dict2[all_letters[i]] = all_letters[(i-key)%(len(all_letters))]
decrypt_txt = []
for char in cipher_txt:
    if char in all_letters:
        temp = dict2[char]
        decrypt_txt.append(temp)
    else:
        temp = char
        decrypt_txt.append(temp)
decrypt_txt = "".join(decrypt_txt)
```

A terminal window titled 'stud@stud-OptiPlex-3060: ~/Desktop' with three tabs. The first tab is active and shows the command 'python3 substitution.py' being executed. The program prompts 'Enter the message : ' and the user enters 'Hi, Welcome in CNS Lab'. The program outputs 'Cipher Text is: Lm, aipgsqi mr GRW Pef'. The prompt 'stud@stud-OptiPlex-3060:~/Desktop\$' is visible at the bottom.

```
stud@stud-OptiPlex-3060: ~/Desktop
stud@stud-OptiPlex-3060:~/Desktop$ python3 substitution.py
Enter the message : Hi, Welcome in CNS Lab

Cipher Text is: Lm, aipgsqi mr GRW Pef
stud@stud-OptiPlex-3060:~/Desktop$
```

### 3. Hill Cipher

```
keyMatrix = [[0] * 3 for i in range(3)]
messageVector = [[0] for i in range(3)]
cipherMatrix = [[0] for i in range(3)]
def getKeyMatrix(key):
    k = 0
    for i in range(3):
        for j in range(3):
            keyMatrix[i][j] = ord(key[k]) % 65
            k += 1
def encrypt(messageVector):
    for i in range(3):
        for j in range(1):
            cipherMatrix[i][j] = 0
            for x in range(3):
                cipherMatrix[i][j] += (keyMatrix[i][x] *
                                         messageVector[x][j])
            cipherMatrix[i][j] = cipherMatrix[i][j] % 26
def HillCipher(message, key):
    getKeyMatrix(key)
    for i in range(3):
        messageVector[i][0] = ord(message[i]) % 65
    encrypt(messageVector)
    CipherText = []
    for i in range(3):
        CipherText.append(chr(cipherMatrix[i][0] + 65))

    print("Ciphertext: ", "".join(CipherText))

def main():
    message = input("Enter the message : ")
    key = "GYBNQKURP"
    HillCipher(message, key)

if __name__ == "__main__":
    main()
```

```
stud@stud-OptiPlex-3060: ~/Desktop
stud@stud-OptiPlex-3060:~/Desktop$ python3 hill.py
Enter the message : POS
Ciphertext: CBC
stud@stud-OptiPlex-3060:~/Desktop$
```