

1. Assign2.py

```
import math
def encryptMessage(msg):
    cipher = ""
    k_indx = 0
    msg = msg.replace(" ", "#")
    msg_len = len(msg)
    msg_lst = list(msg)
    key_lst = sorted(list(key))
    col = len(key)
    row = int(math.ceil(msg_len / col))
    fill_null = int((row * col) - msg_len)
    msg_lst.extend('_' * fill_null)
    matrix = [msg_lst[i: i + col] for i in range(0,
len(msg_lst), col)]
    key_order = sorted(range(len(key)), key=lambda x:
key[x])

    for i in range(col):
        curr_idx = key_order[i]
        cipher += ''.join([row[curr_idx] for row in
matrix])
    return cipher

def decryptMessage(cipher):
    msg = ""
    k_indx = 0
    msg_indx = 0
    msg_len = len(cipher)
    msg_lst = list(cipher)
    col = len(key)
    row = int(math.ceil(msg_len / col))
    key_lst = sorted(list(key))
    dec_cipher = []

    for _ in range(row):
        dec_cipher += [[None] * col]
    key_order = sorted(range(len(key)), key=lambda x:
key[x])

    for k in range(col):
```

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curr_idx = key_order[k]

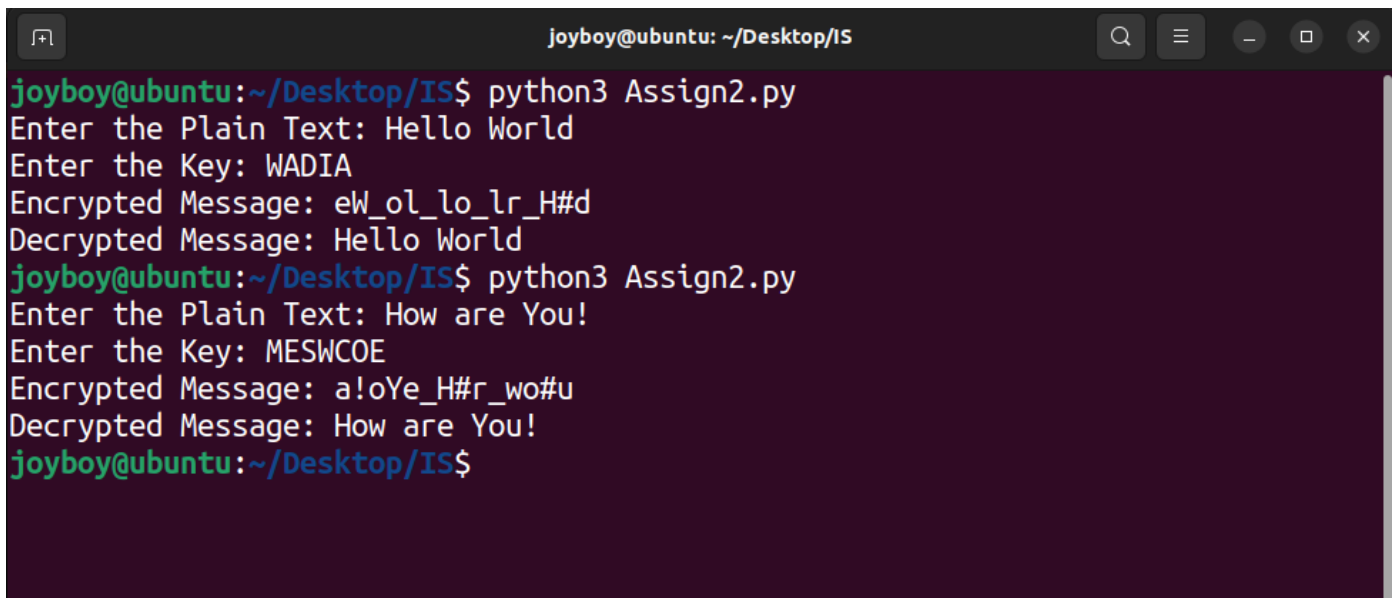
for j in range(row):
    dec_cipher[j][curr_idx] = msg_lst[msg_idx]
    msg_idx += 1
msg = ''.join(sum(dec_cipher, []))
msg = msg.replace("_", "")
msg = msg.replace("#", " ")
return msg

msg = input("Enter the Plain Text: ")
key = input("Enter the Key: ")
cipher = encryptMessage(msg)
print("Encrypted Message:", cipher)

print("Decrypted Message:", decryptMessage(cipher))

```

2. Output



A terminal window titled 'joyboy@ubuntu: ~/Desktop/IS' shows the execution of a Python script named 'Assign2.py'. The user enters 'Hello World' as the plain text and 'WADIA' as the key. The output shows the encrypted message 'eW_ol_lo_lr_H#d' and the decrypted message 'Hello World'. The user then enters 'How are You!' as the plain text and 'MESWCOE' as the key. The output shows the encrypted message 'a!oYe_H#r_wo#u' and the decrypted message 'How are You!'.

```

joyboy@ubuntu:~/Desktop/IS$ python3 Assign2.py
Enter the Plain Text: Hello World
Enter the Key: WADIA
Encrypted Message: eW_ol_lo_lr_H#d
Decrypted Message: Hello World
joyboy@ubuntu:~/Desktop/IS$ python3 Assign2.py
Enter the Plain Text: How are You!
Enter the Key: MESWCOE
Encrypted Message: a!oYe_H#r_wo#u
Decrypted Message: How are You!
joyboy@ubuntu:~/Desktop/IS$

```