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):
```

```
            curr_idx = key_order[k]

            for j in range(row):
                dec_cipher[j][curr_idx] = msg_lst[msg_indx]
                msg_indx += 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**