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**Class:- TE Computer**

**ERP :-38**

**Subject :-LP2(IS) (Transposition)**

## **Code:-**

```
import math

key = "HACK"

# Encryption
def encryptMessage(msg):
    cipher = ""

    # track key indices
    k_indx = 0

    msg_len = float(len(msg))
    msg_lst = list(msg)
    key_lst = sorted(list(key))

    # calculate column of the matrix
    col = len(key)

    # calculate maximum row of the matrix
    row = int(math.ceil(msg_len / col))

    # add the padding character '_' in empty
    # the empty cell of the matrix
    fill_null = int((row * col) - msg_len)
    msg_lst.extend('_' * fill_null)

    # create Matrix and insert message and
    # padding characters row-wise
    matrix = [msg_lst[i: i + col]
               for i in range(0, len(msg_lst), col)]

    # read matrix column-wise using key
    for _ in range(col):
        curr_idx = key.index(key_lst[k_indx])
        cipher += ".join([row[curr_idx]
                        for row in matrix])
        k_indx += 1

    return cipher
```

```

# Decryption
def decryptMessage(cipher):
    msg = ""

    # track key indices
    k_indx = 0

    # track msg indices
    msg_indx = 0
    msg_len = float(len(cipher))
    msg_lst = list(cipher)

    # calculate column of the matrix
    col = len(key)

    # calculate maximum row of the matrix
    row = int(math.ceil(msg_len / col))

    # convert key into list and sort
    # alphabetically so we can access
    # each character by its alphabetical position.
    key_lst = sorted(list(key))

    # create an empty matrix to
    # store deciphered message
    dec_cipher = []
    for _ in range(row):
        dec_cipher += [[None] * col]

    # Arrange the matrix column wise according
    # to permutation order by adding into new matrix
    for _ in range(col):
        curr_idx = key.index(key_lst[k_indx])

        for j in range(row):
            dec_cipher[j][curr_idx] = msg_lst[msg_indx]
            msg_indx += 1
            k_indx += 1

    # convert decrypted msg matrix into a string
    try:
        msg = ''.join(sum(dec_cipher, []))
    except TypeError:
        raise TypeError("This program cannot",
                        "handle repeating words.")

    null_count = msg.count('_')

```

```
if null_count > 0:
    return msg[: -null_count]

return msg

# Driver Code

msg = (input("Enter Message: "))

cipher = encryptMessage(msg)
print("Encrypted Message: {}".
      format(cipher))

print("Decryped Message: {}".
      format(decryptMessage(cipher)))
```

## Output:-

Enter Message: Its KK29 aka Kaustubh

Encrypted Message: tKaKt\_s2kau\_IK sh 9aub\_

Decryped Message: Its KK29 aka Kaustubh

Process finished with exit code 0

```
C:\Users\asus\PycharmProjects\AStar\Scripts\python.exe "C:/Users/asus/PycharmProjects/AStar/2. Transposition.py"
Enter Message: Its KK29 aka Kaustubh
Encrypted Message: tKaKt_s2kau_IK sh 9aub_
Decryped Message: Its KK29 aka Kaustubh

Process finished with exit code 0
|
```