

Experiment no: 1d
Date: 13/2/24

Columnar Transposition Techniques

AIM:

To Write the python program to Perform Columnar transposition technique To Both Encryption And Decryption

ALGORITHM:

Step 1: START

Step 2: Get the Input from the User

Step 3: The Message is Read out Again Column by Column And the Column are Chosen

Step 4: Width of the Rows And the permutation of the Columns are Given By the Keyword

Step 5: The permutation is Defined by Alphabetical Order of the Letters in the Keyword

Step 6: Any Spaces are filled with Null or Left Blank

Step 7: Finally the Message is printed off in Columns

Step 8: STOP

Exp 1d : Columnar Transposition Techniques

Code:

```
import math

key = "HACK"

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

    k_indx = 0

    msg_len = float(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)]

    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 = ""

    k_indx = 0

    msg_indx = 0
    msg_len = float(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]

for _ in range(col):
    curr_idx = key.index(key_lst[k_idx])

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

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 the message: ")

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

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

Output:

```
Enter the message: Jeff is Cool
Encrypted Message: eiofsoJ Cf l
Decrypted Message: Jeff is Cool
> |
```