CSA5122-CRYPTOGRAPHY FOR NETWORK AND SECURITY

LAB PROGRAMS EXECUTION

6.COLUMNAR TRANSPOSITION CIPHER

#include <stdio.h>

#include <string.h>

#include <math.h>

void encrypt(char msg[], int key) {

int len = strlen(msg);

int rows = ceil((float)len / key);

char matrix[rows][key];

int k = 0;

// Fill matrix row-wise

for (int i = 0; i < rows; i++)

for (int j = 0; j < key; j++)

matrix[i][j] = (k < len) ? msg[k++] : 'X'; // padding

// Read column-wise for encryption

printf("Encrypted: ");

for (int j = 0; j < key; j++)

for (int i = 0; i < rows; i++)

printf("%c", matrix[i][j]);

printf("\n");

}

void decrypt(char msg[], int key) {

int len = strlen(msg);

int rows = ceil((float)len / key);

char matrix[rows][key];

int k = 0;

// Fill matrix column-wise

for (int j = 0; j < key; j++)

for (int i = 0; i < rows; i++)

matrix[i][j] = (k < len) ? msg[k++] : 'X';

// Read row-wise for original message

printf("Decrypted: ");

for (int i = 0; i < rows; i++)

for (int j = 0; j < key; j++)

printf("%c", matrix[i][j]);

printf("\n");

}

int main() {

char msg[100];

int key, choice;

printf("1. Encrypt\n2. Decrypt\nChoice: ");

scanf("%d", &choice);

getchar(); // clear newline

printf("Enter message (without spaces): ");

fgets(msg, sizeof(msg), stdin);

msg[strcspn(msg, "\n")] = '\0';

printf("Enter key (number of columns): ");

scanf("%d", &key);

if (choice == 1)

encrypt(msg, key);

else if (choice == 2)

decrypt(msg, key);

else

printf("Invalid choice.\n");

return 0;

}

