**EXP NO:2 DATE: 03/01/24**

**PLAYFAIR CIPHER**

**Aim:** To implement an encryption algorithm using Playfair Cipher

technique.

**Algorithm:**

● Step 1: "Algorithm" (as the key) and "ulroaliocvrx" (as the encrypted text). ● Step 2: Remove spaces and convert to lowercase.

● Step 3: Create a 5x5 key table based on the modified key.

● Step 4: Apply Playfair Cipher decryption to the encrypted text using the generated key table.

● Step 5: Display the deciphered text.

**Program:**

#include <stdio.h>

#include <stdlib.h>

#include <string.h> #define SIZE 30

void toLowerCase(char plain[], int

ps) { int i;

for (i = 0; i < ps; i++) { if

(plain[i] > 64 && plain[i] < 91)

plain[i] += 32;

} } int removeSpaces(char\* plain,

int ps) {

int i, count = 0;

for (i = 0; i < ps;

i++)

if (plain[i] != ' ')

plain[count++] =

plain[i]; plain[count] =

'\0'; return count;

}

void generateKeyTable(char key[], int ks, char keyT[5][5]) { int i, j, k, flag = 0,

\*dicty; dicty = (int\*)calloc(26,

sizeof(int)); for (i = 0; i < ks;

i++) { if (key[i] != 'j')

dicty[key[i] - 97] = 2;

}

dicty['j' - 97] =

1; i = 0; j =

0;

for (k = 0; k < ks; k++) {

if (dicty[key[k] - 97] == 2)

{ dicty[key[k] - 97] -= 1;

keyT[i][j] = key[k];

j++; if (j

== 5) {

i++; j =

0; }

}

}

for (k = 0; k < 26; k++) {

if (dicty[k] == 0) {

keyT[i][j] = (char)(k +

97);

j++; if (j

== 5) {

i++; j =

0;

}

}

} } void search(char keyT[5][5], char a, char b, int arr[]) { int i, j;

if (a == 'j')

a = 'i'; else if

(b == 'j') b =

'i';

for (i = 0; i < 5; i++) {

for (j = 0; j < 5; j++) {

if (keyT[i][j] == a) {

arr[0] = i;

arr[1] = j;

}

else if (keyT[i][j] == b) {

arr[2] = i;

arr[3] = j;

}

}

}

}

int mod5(int a) {

if (a < 0) a

+= 5; return

(a % 5);

} void decrypt(char str[], char keyT[5][5], int ps) { int i,

a[4];

for (i = 0; i < ps; i += 2) {

search(keyT, str[i], str[i + 1],

a); if (a[0] == a[2]) {

str[i] = keyT[a[0]][mod5(a[1] - 1)]; str[i + 1]

= keyT[a[0]][mod5(a[3] - 1)]; }

else if (a[1] == a[3]) {

str[i] = keyT[mod5(a[0] - 1)][a[1]]; str[i + 1]

= keyT[mod5(a[2] - 1)][a[1]]; }

else { str[i] =

keyT[a[0]][a[3]];

str[i + 1] = keyT[a[2]][a[1]];

}

} } void decryptByPlayfairCipher(char str[], char key[]) { char ps, ks, keyT[5][5];

ks = strlen(key);

ks = removeSpaces(key, ks);

toLowerCase(key, ks);

ps = strlen(str);

toLowerCase(str, ps);

ps = removeSpaces(str, ps); generateKeyTable(key, ks, keyT);

decrypt(str, keyT, ps);

}

int main() { char

str[SIZE], key[SIZE];

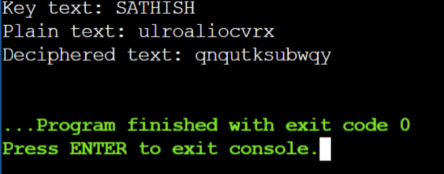
strcpy(key, "Varusha");

printf("Key text: %s\n", key); strcpy(str, "ulroaliocvrx"); printf("Plain text: %s\n", str); decryptByPlayfairCipher(str, key); printf("Deciphered text: %s\n", str);

return 0;

}

**Output:**



**Result:**

Thus the encryption algorithm using Playfair Cipher technique is implemented successfully.