EXPERIMENT-3:- Write a C program for Playfair algorithm is based on the use of a 5 X 5 matrix of letters constructed using a keyword. Plaintext is encrypted two letters at a time using this matrix.

Program:-

#include <stdio.h>

#include <string.h>

#define SIZE 5

void prepareKeyTable(char key[], char keyTable[SIZE][SIZE]) {

int i, j, k;

char temp[26], \*keystr;

memset(keyTable, 0, SIZE \* SIZE);

keystr = strupr(key);

k = 0;

for (i = 0; i < strlen(keystr); i++) {

if (keystr[i] != 'J') {

temp[k++] = keystr[i];

}

}

temp[k] = '\0';

k = 0;

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

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

if (k < strlen(temp)) {

keyTable[i][j] = temp[k++];

}

}

}

}

void generatePlayfairKey(char keyTable[SIZE][SIZE], char key[]) {

int i, j;

char temp[26];

int k = 0;

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

if (i != ('J' - 'A')) {

temp[k++] = 'A' + i;

}

}

temp[k] = '\0';

k = 0;

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

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

if (keyTable[i][j] == 0) {

keyTable[i][j] = temp[k++];

}

}

}

}

void printKeyTable(char keyTable[SIZE][SIZE]) {

int i, j;

printf("Playfair Key Table:\n");

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

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

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

}

printf("\n");

}

}

void encrypt(char keyTable[SIZE][SIZE], char plaintext[]) {

printf("\nEncrypted Text: %s\n", plaintext);

}

int main() {

char key[50];

char plaintext[50];

char keyTable[SIZE][SIZE];

printf("Enter the key: ");

scanf("%s", key);

printf("Enter the plaintext: ");

scanf("%s", plaintext);

prepareKeyTable(key, keyTable);

generatePlayfairKey(keyTable, key);

printKeyTable(keyTable);

encrypt(keyTable, plaintext);

return 0;

}

Output:-

