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AC LAB 2

1. C program to implement Caesar Cipher substitution technique.

Code:

```
#include<stdio.h>
#include<string.h>
#include<conio.h>
#include<ctype.h>

void main()
{
   char plain[10], cipher[10];
   int key,i,length;
   int result;
   printf("\n Enter the plain text: ");
   scanf("%s",plain);
   printf("\n Enter the key value: ");
   scanf("%d",&key);
   printf("\n\n\t Plain Text: %s", plain);
   printf("\n\n\t Encrypted Text: ");
   for(i=0, length=strlen(plain);i<length; i++)
   {
    cipher[i]=(plain[i])+key;
    if(isupper(plain[i]) && (cipher[i]>'Z'))
       cipher[i]=(cipher[i])-26;
    if(isupper(plain[i]) && (cipher[i]>'z'))
    cipher[i]=cipher[i]-26;
    printf("%c",cipher[i]);
   }
   printf("\n\n\t After Decryption: ");
   for(i=0;i<length;i++)
   {
       plain[i]=cipher[i]-key;
    if(isupper(cipher[i]) && (plain[i]<'A'))
       plain[i]=plain[i]+26;
    if(islower(cipher[i]) && (plain[i]<'a'))
    plain[i]=plain[i]+26;
```

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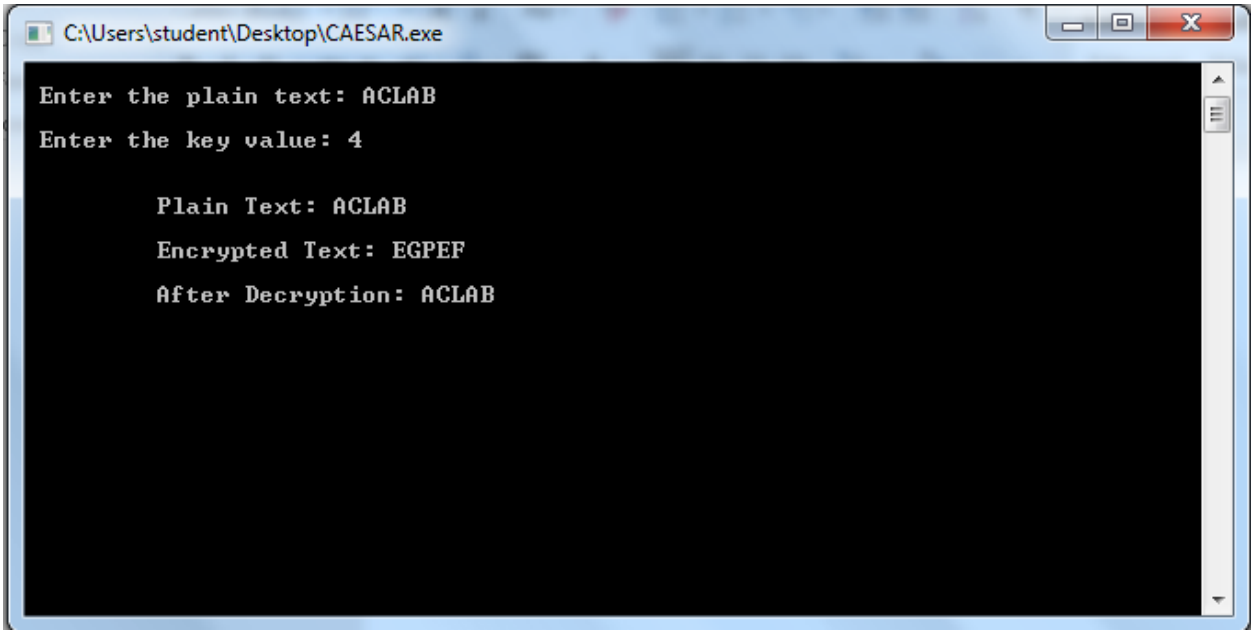
```
    printf("%c",plain[i]);
   }
getch();
}
```

OUTPUT:



2. C program to implement Playcipher

```
#include <stdio.h>

#include <conio.h>

#include <string.h>

#include <ctype.h>

#define MX 5

int choice;

void playfair(char ch1, char ch2, char key[MX][MX]) {

 int i, j, w, x, y, z;
```

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```
for (i = 0; i < MX; i++) {
for (j = 0; j < MX; j++) {
if (ch1 == key[i][j]) {
w = i;
x = j;
} else if (ch2 == key[i][j]) {
y = i;
z = j;
}
}
}
//printf("%d%d %d%d",w,x,y,z);
if (w == y) {
if(choice==1){
x = (x + 1) % 5;
z = (z + 1) % 5;
}
else{
x = ((x - 1) % 5+5)%5;
z = ((z - 1) % 5+5)%5;
}
printf("%c%c", key[w][x], key[y][z]);
} else if (x == z) {
if(choice==1){
w = (w + 1) % 5;
y = (y + 1) % 5;
```

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```
}
else{
w = ((w - 1) % 5+5)%5;
y = ((y - 1) % 5+5)%5;
}
 printf("%c%c", key[w][x], key[y][z]);
 }
else {
 printf("%c%c", key[w][z], key[y][x]);
 }
}
void removeDuplicates(char str[]){
 int hash[256] = {0};
 int currentIndex = 0;
 int lastUniqueIndex = 0;
 while(*(str+currentIndex)){
 char temp = *(str+currentIndex);
 if(0 == hash[temp]){
 hash[temp] = 1;
 *(str+lastUniqueIndex) = temp;
 lastUniqueIndex++;
 }
 currentIndex++;
 }
 *(str+lastUniqueIndex) = '\0';
}
```

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```
void main() {
 int i, j, k = 0, l, m = 0, n;
 char key[MX][MX], keyminus[25], keystr[10], str[25] = {
 0
 };
 char alpa[26] = {

'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z'
 };
fflush(stdin);
 printf("\nEnter key:");
 gets(keystr);
 printf("Enter the Plain text:");
 gets(str);
removeDuplicates(keystr);
 n = strlen(keystr);
 //convert the characters to uppertext
 for (i = 0; i < n; i++) {
 if (keystr[i] == 'j') keystr[i] = 'i';
 else if (keystr[i] == 'J') keystr[i] = 'I';
 keystr[i] = toupper(keystr[i]);
 }
 //convert all the characters of plaintext to uppertext
 for (i = 0; i < strlen(str); i++) {
 if (str[i] == 'j') str[i] = 'i';
 else if (str[i] == 'J') str[i] = 'I';
```

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```
str[i] = toupper(str[i]);
}
// store all characters except key
j = 0;
for (i = 0; i < 26; i++) {
for (k = 0; k < n; k++) {
if (keystr[k] == alpa[i]) break;
else if (alpa[i] == 'J') break;
}
if (k == n) {
keyminus[j] = alpa[i];
j++;
}
}
//construct key keymatrix
k = 0;
for (i = 0; i < MX; i++) {
for (j = 0; j < MX; j++) {
if (k < n) {
key[i][j] = keystr[k];
k++;
} else {
key[i][j] = keyminus[m];
m++;
}
printf("%c ", key[i][j]);
```

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```
}
printf("\n");
}
// construct diagram and convert to cipher text
printf("\nEntered text :%s\nCipher Text :", str);
for (i = 0; i < strlen(str); i++) {
if (str[i] == 'J') str[i] = 'I';
if (str[i + 1] == '\0') playfair(str[i], 'X', key);
else {
if (str[i + 1] == 'J') str[i + 1] = 'I';
if (str[i] == str[i + 1]) playfair(str[i], 'X', key);
else {
playfair(str[i], str[i + 1], key);
i++;
}
}
}
}
```

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Output: