Date :

PRACTICAL-6

Objective – WAP to implement the Playfair Cipher.

Code-

```
#include <stdio.h>
#include <conio.h>
#include <string.h>
#include <ctype.h>
#define MX 5
        void
        playfair(char ch1, char ch2, char key[MX][MX])
{
   int i, j, w, x, y, z;
   FILE *out;
   if ((out = fopen("cipher.txt", "a+")) == NULL)
   {
      printf("File Currupted.");
   }
   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)
{
    x = (x + 1) % 5;
    z = (z + 1) % 5;
    printf("%c%c", key[w][x], key[y][z]);
    fprintf(out, "%c%c", key[w][x], key[y][z]);
}
else if (x == z)
{
    w = (w + 1) % 5;
    y = (y + 1) % 5;
    printf("%c%c", key[w][x], key[y][z]);
    fprintf(out, "%c%c", key[w][x], key[y][z]);
}
else
{
    printf("%c%c", key[w][z], key[y][x]);
```

```
        fprintf(out, "%c%c", key[w][z], key[y][x]);
    }
    fclose(out);
}
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'};
    printf("\nEnter key:");
    gets(keystr);
    printf("\nEnter the plain text:");
    gets(str);
    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';
   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]);
   }
   printf("\n");
}
// construct diagram and convert to cipher text
printf("\n\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++;
            }
        }
    }
    getch();
}
```

Output-