Ex. No.: 1(b) **PLAYFAIR CIPHER** **Reg. No.: 210701282**

Date:

AIM:

To implement Playfair Cipher technique using C.

ALGORITHM:

1. Initialize the contents of the table to zero.
2. Get the length of the key
3. Get the key string from the user.
4. Insert each element of the key into the table.
5. Fill the remaining entries of the table with the character not already entered into the table.
6. Enter the length of the plaintext.
7. Get the plaintext string.

PROGRAM CODE:

```
#include<stdio.h>
int check(char table[5][5],char k)
{
int i,j;
for(i=0;i<5;++i)
for(j=0;j<5;++j)
{
if(table[i][j]==k)
return 0;
}
return 1;
}
void main()
{
int i,j,key_len;
char table[5][5];
for(i=0;i<5;++i)
 for(j=0;j<5;++j)
table[i][j]='0';
```

```
printf("**********Playfair Cipher**********\n\n");
printf("Enter the length of the Key. ");
scanf("%d",&key_len);
char key[key_len];
printf("Enter the Key. ");
for(i=-1;i<key_len;++i)
{
scanf("%c",&key[i]);
if(key[i]=='j')
key[i]='i';
}
int flag;
int count=0;
// inserting the key into the table
for(i=0;i<5;++i)
{
for(j=0;j<5;++j)
{
flag=0;
while(flag!=1)
{
if(count>key_len)
goto l1;
flag=check(table,key[count]);
++count;
}// end of while
table[i][j]=key[(count-1)];
}// end of inner for
}// end of outer for
l1:printf("\n");

int val=97;
//inserting other alphabets
for(i=0;i<5;++i)
```

```
{
 for(j=0;j<5;++j)
 {
if(table[i][j]>=97 && table[i][j]<=123)
{}
else
{
flag=0;
while(flag!=1)
{
if('j'==(char)val)
++val;
flag=check(table,(char)val);
++val;
}// end of while
table[i][j]=(char)(val-1);
}//end of else
 }// end of inner for
}// end of outer for
printf("The table is as follows:\n");
for(i=0;i<5;++i)
{
 for(j=0;j<5;++j)
 {
printf("%c ",table[i][j]);
 }
printf("\n");
}
int l=0;
printf("\nEnter the length of plain text.(without spaces) ");
scanf("%d",&l);
printf("\nEnter the Plain text. ");
char p[l];
for(i=-1;i<l;++i)
```

```
{
scanf("%c",&p[i]);
}
for(i=-1;i<l;++i)
{
if(p[i]=='j')
p[i]='i';
}
printf("\nThe replaced text(j with i)");
for(i=-1;i<l;++i)
printf("%c ",p[i]);
count=0;
for(i=-1;i<l;++i)

{
if(p[i]==p[i+1])
count=count+1;
}
printf("\nThe cipher has to enter %d bogus char.It is either 'x' or 'z'\n",count);
int length=0;
if((l+count)%2!=0)
length=(l+count+1);
else
length=(l+count);
printf("\nValue of length is %d.\n",length);
char p1[length];
//inserting bogus characters.
char temp1;
int count1=0;
for(i=-1;i<l;++i)
{
p1[count1]=p[i];
if(p[i]==p[i+1])
{
```

```
count1=count1+1;
if(p[i]=='x')
p1[count1]='z';
else p1[count1]='x';
}
count1=count1+1;
}
//checking for length
char bogus;
if((l+count)%2!=0)
{
if(p1[length-1]=='x')
p1[length]='z';
else
p1[length]='x';
}
printf("The final text is:");
for(i=0;i<=length;++i)
printf("%c ",p1[i]);
char cipher_text[length];
int r1,r2,c1,c2;
int k1;
for(k1=1;k1<=length;++k1)
{
for(i=0;i<5;++i)
{
for(j=0;j<5;++j)
{
if(table[i][j]==p1[k1])
{
r1=i;
c1=j;
}
```

```
else
if(table[i][j]==p1[k1+1])
{
r2=i;
c2=j;
}
}//end of for with j
}//end of for with i
(r1==r2)
{
cipher_text[k1]=table[r1][(c1+1)%5];
cipher_text[k1+1]=table[r1][(c2+1)%5];
}
else
if(c1==c2)
{
cipher_text[k1]=table[(r1+1)%5][c1];
cipher_text[k1+1]=table[(r2+1)%5][c1];
}
else
{
cipher_text[k1]=table[r1][c2];
cipher_text[k1+1]=table[r2][c1];
}
k1=k1+1;
}//end of for with k1
printf("\n\nThe Cipher text is:\n ");
for(i=1;i<=length;++i)
printf("%c ",cipher_text[i]);
}
```

OUTPUT:

```
[root@fedora student]# vi 282_playFair.c
[root@fedora student]# cc 282_playFair.c
[root@fedora student]# ./a.out
**********Playfair Cipher************

Enter the length of the Key: 5
Enter the Key: hello

The table is as follows:
h e l o a
b c d f g
i k m n p
q r s t u
v w x y z

Enter the length of plain text (without spaces): 7
Enter the Plain text: runaway

The replaced text (j with i): r u n a w a y
The cipher has to enter 0 bogus char. It is either 'x' or 'z'

Value of length is 8.
The final text is: r u n a w a y  x

The Cipher text is: s q p o z e z o
```

RESULT: