AIM:

ALGORITHM:

OUTPUT:

```
**********Playfair Cipher************

Enter the length of the Key. 15
Enter the Key. therowsareclean

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

Enter the length length of plain text.(without spaces) 25

Enter the Plain text. theclassissilent

withoutnoise

The replaced text(j with i) t h e c l a s s i s s i l e n t

 w i t h o u t
The cipher has to enter 3 bogus char.It is either 'x' or 'z'

Value of length is 28.
The final text is: t h e c l a s x s i s x s i l e n t
 x
 w i t h o u t

The Cipher text is:
 h e r a w c a v w k a v w k a o i w d u i n u w e t t w
--------------------------------
Process exited after 75.94 seconds with return value 29
Press any key to continue . . . |
```

PROGRAM:

```c
#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);
```

```c
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;

    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;
            }
            table[i][j] = key[(count - 1)];
        }
    }
```

```c
 l1: printf("\n");
 int val = 97;


    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;
                }
                table[i][j] = (char) (val - 1);
            }
        }
    }


    printf("The table is as follows:\n");
    for (i = 0; i < 5; ++i) {
        for (j = 0; j < 5; ++j) {
            printf("%c ", table[i][j]);
        }
```

```c
    printf("\n");
    }


    int l = 0;
    printf("\nEnter the length 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) {
```

```c
 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];


   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')
```

```c
            p1[count1] = 'z';
        else
            p1[count1] = 'x';
    }
    count1 = count1 + 1;
}


    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


    if (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];
```

```c
        }
      k1 = k1 + 1;
        }


        printf("\n\nThe Cipher text is:\n ");
        for (i = 1; i <= length; ++i)
            printf("%c ", cipher_text[i]);

}
```

RESULT: