**WEEK 2**

**Implementation of play fair cipher**

- Assume key matrix is given to us.
- Read plain text(2 characters) from user.
- This program demonstrate four rules of the Playfair encryption algorithm.
- This program will process only 2 characters input.
- You may extend to process n characters by repeating given logic.
- Add suitable exception for completing this program.

```
#include<stdio.h>
int main(){
 char arr[5][5]={"MONAR","CHYBD","EFGIK","LPQST","UVWXZ"};
 char pt[10];
 int i, j, r1=0, r2=0, c1=0, c2=0;
 printf("Playfair Keymatrix\n==================\n");
 for(i=0; i<5; i++)
 {
  for(j=0; j<5; j++)
  printf("%c ", arr[i][j]);
  printf("\n");
 }
 printf("Enter your plain text:");
 scanf("%s",pt);
 printf("Your plain text = %s", pt);
 for(i=0; i<5; i++)
 {
  for(j=0; j<5; j++)
  {
    if(arr[i][j] == pt[0])
    {
     r1=i; c1=j;
    }
    if(arr[i][j] == pt[1])
    {
     r2=i; c2=j;
    }
  }
 }
 if(r1==r2) //when both characters in same row
 {
  if(c2==4) //for char in last column
    printf("Ciphertext = %c%c \n", arr[r1][c1+1], arr[r2][0]);
```

```
   else
      printf("Ciphertext = %c%c \n", arr[r1][c1+1], arr[r2][c2+1]);
  }
  if(c1==c2)//when both characters in same column
  {
    if(r2==4) //for char in last row
      printf("Ciphertext = %c%c \n", arr[r1+1][c1], arr[0][c2]);
    else
      printf("Ciphertext = %c%c \n", arr[r1+1][c1], arr[r2+1][c2]);
  }
  //when characters are not in a same row and column
  if(r1 != r2 && c1 != c2)
  {
    printf("\nCiphertext = %c%c \n", arr[r1][c2], arr[r2][c1]);
  }
  return 0;
}
```

**Output of the program**

```
Playfair Keymatrix
==================
M O N A R
C H Y B D
E F G I K
L P Q S T
U V W X Z
Enter your plain text:IN
Your plain text = IN
Ciphertext = GA
```