Information Security

Practical-3: Playfair Cipher

CODE:

```
#include<stdio.h>
#include<string.h>
#include<ctype.h>
int removerepeated(int size,int a[]);
int insertelementat(int position,int a[],int size);
main()
{
 int i,j,k,numstr[100],numcipher[100],numkey[100],lenkey,templen,tempkey[100],flag=-1,size,cipherkey[5][5],lennumstr,row1,row2,col1,col2;
 char str[100],key[100];
 printf("Enter a string : ");
 gets(str);
 for(i=0,j=0;i<strlen(str);i++)
 {
  if(str[i]!=' ')
  {
   str[j]=toupper(str[i]);
```

```
 j++;
 }
}

printf("\n-------------------------\n");

str[j]='\0';
printf("Entered String is %s",str);
size=strlen(str);
for(i=0;i<size;i++)
{
 if(str[i]!=' ')
 numstr[i]=str[i]-'A';
}
lennumstr=i;
printf("\n-------------------------\n");



printf("Enter the key : ");
gets(key);
for(i=0,j=0;i<strlen(key);i++)
{
```

```
 if(key[i]!=' ')
 {
  key[j]=toupper(key[i]);
  j++;
 }
}
key[j]='\0';
printf(" Entered key is %s\n",key);



k=0;
for(i=0;i<strlen(key)+26;i++)
{
 if(i<strlen(key))
 {
  if(key[i]=='J')
  {
   flag=8;
   printf("%d",flag);
  }
      numkey[i]=key[i]-'A';
 }
```

```
 else
 {
   if(k!=9 && k!=flag)
   {
          numkey[i]=k;
     }
     k++;
 }
}
templen=i;
lenkey=removerepeated(templen,numkey);
printf("\n-------------------------\n");
printf("Entered key converted according to Play Fair Cipher rule\n");
for(i=0;i<lenkey;i++)
{
    printf("%c",numkey[i]+'A');
}
printf("\n");
k=0;
for(i=0;i<5;i++)
{
 for(j=0;j<5;j++)
```

```
 {
  cipherkey[i][j]=numkey[k];
  k++;
 }
}
printf("\n-------------------------\n");
printf("Arranged key\n");
for(i=0;i<5;i++)
{
 for(j=0;j<5;j++)
 {
  printf("%c |",cipherkey[i][j]+'A');
 }
 printf("\n");
}

 for(i=0;i<lennumstr;i+=2)
 {
    if(numstr[i]==numstr[i+1])
    {
     insertelementat(i+1,numstr,lennumstr);
     lennumstr++;
```

```
    }
  }
  if(lennumstr%2!=0)
  {
   insertelementat(lennumstr,numstr,lennumstr);
   lennumstr++;
  }
  printf("\n-------------------------\n");
  printf("Entered String/Message After Processing according to Play fair
cipher rule\n");
  for(i=0;i<lennumstr;i++)
  {
   printf("%c",numstr[i]+'A');
  }
  for(k=0;k<lennumstr;k+=2)
  {
   for(i=0;i<5;i++)
   {
    for(j=0;j<5;j++)
    {
     if(numstr[k]==cipherkey[i][j])
     {
```

```
    row1=i;
    col1=j;
  }
  if(numstr[k+1]==cipherkey[i][j])
  {
    row2=i;
    col2=j;
  }
 }
}

if(row1==row2)
{
 col1=(col1-1)%5;
 col2=(col2-1)%5;
 if(col1<0)
 {
  col1=5+col1;
 }
 if(col2<0)
 {
  col2=5+col2;
```

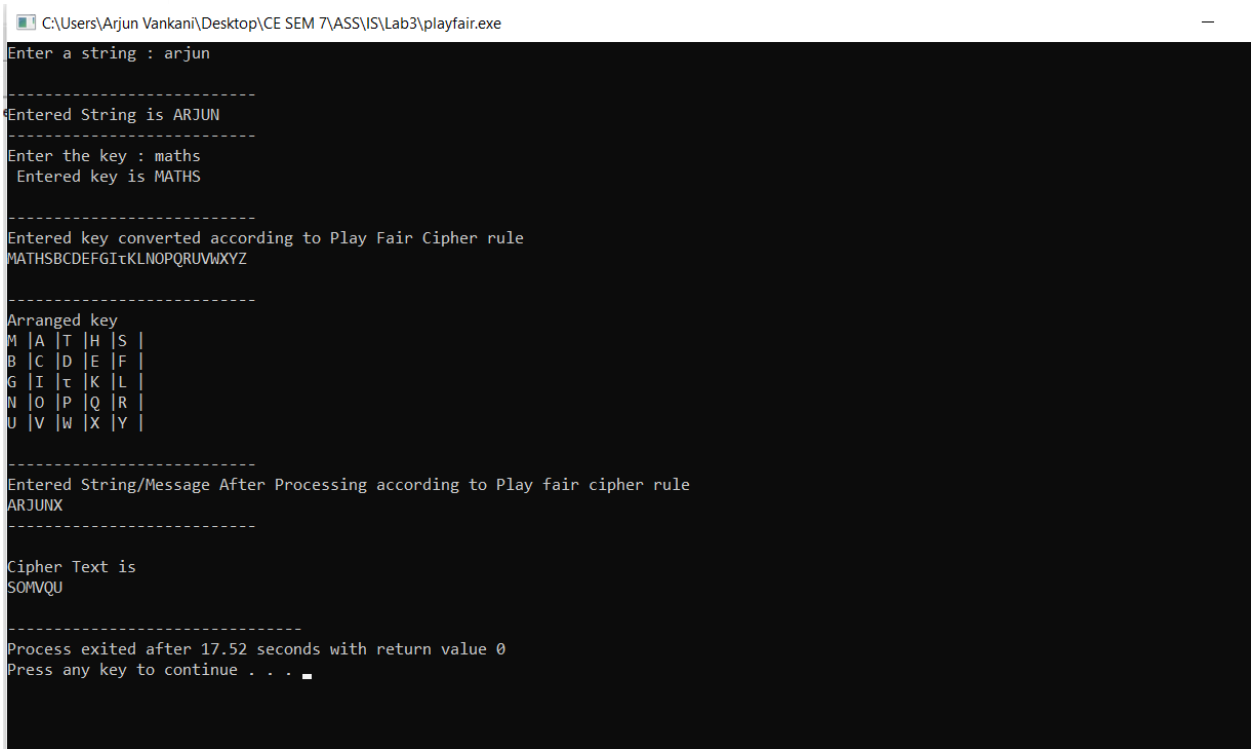
```
 }
 numcipher[k]=cipherkey[row1][col1];
 numcipher[k+1]=cipherkey[row2][col2];
}
if(col1==col2)
{
 row1=(row1-1)%5;
 row2=(row2-1)%5;
  if(row1<0)
 {
  row1=5+row1;
 }
 if(row2<0)
 {
  row2=5+row2;
 }
 numcipher[k]=cipherkey[row1][col1];
 numcipher[k+1]=cipherkey[row2][col2];
}
if(row1!=row2&&col1!=col2)
{
 numcipher[k]=cipherkey[row1][col2];
```

```
    numcipher[k+1]=cipherkey[row2][col1];
   }
  }
  printf("\n-------------------------\n");
  printf("\nCipher Text is\n");
  for(i=0;i<lennumstr;i++)
  {
   if((numcipher[i]+'A')!='X')
     printf("%c",numcipher[i]+'A');
  }
  printf("\n");
}
int removerepeated(int size,int a[])
{
 int i,j,k;
 for(i=0;i<size;i++)
  {
 for(j=i+1;j<size;)
 {
   if(a[i]==a[j])
   {
    for(k=j;k<size;k++)
```

```
    {
     a[k]=a[k+1];
    }
        size--;
       }
   else
   {
     j++;
    }
 }
 }
return(size);
}
int insertelementat(int position,int a[],int size)
{
      int i,insitem=23,temp[size+1];
   for(i=0;i<=size;i++)
       {
       if(i<position)
       {
          temp[i]=a[i];
       }
```

```
    if(i>position)
    {
     temp[i]=a[i-1];
    }
    if(i==position)
    {
       temp[i]=insitem;
    }
    }
    for(i=0;i<=size;i++)
    {
     a[i]=temp[i];
    }
}
```

Output:


C:\Users\Arjun Vankani\Desktop\CE SEM 7\ASS\IS\Lab3\playfair.exe
Enter a string : arjun
Entered String is ARJUN
Enter the key : maths
Entered key is MATHS
Entered key converted according to Play Fair Cipher rule
MATHSBCDEFGIτKLNOPQRUVWXYZ
Arranged key
M |A |T |H |S |
B |C |D |E |F |
G |I |τ |K |L |
N |O |P |Q |R |
U |V |W |X |Y |
Entered String/Message After Processing according to Play fair cipher rule
ARJUNX
Cipher Text is
SOMVQU
Process exited after 17.52 seconds with return value 0
Press any key to continue . . .