**Experiment no 5**

#include<stdio.h>

#include<stdlib.h>

#include<math.h>

#include<string.h>

long int p,q,n,t,flag,e[100],d[100],temp[100],j,m[100],en[100],i;

char msg[100];

int prime(long int);

void ce();

long int cd(long int);

void encrypt();

void decrypt();

int main()

{

printf("\nENTER FIRST PRIME NUMBER\n");

scanf("%ld",&p);

flag=prime(p);

if(flag==0)

{

printf("\nWRONG INPUT\n");

exit(1);

}

printf("\nENTER ANOTHER PRIME NUMBER\n");

scanf("%ld",&q);

flag=prime(q);

if(flag==0||p==q)

{

printf("\nWRONG INPUT\n");

exit(1);

}

printf("\nENTER MESSAGE\n");

fflush(stdin);

scanf("%s",msg);

for(i=0;msg[i]!=NULL;i++)

m[i]=msg[i];

n=p\*q;

t=(p-1)\*(q-1);

ce();

printf("\nPOSSIBLE VALUES OF e AND d ARE\n");

for(i=0;i<j-1;i++)

printf("\n%ld\t%ld",e[i],d[i]);

encrypt();

decrypt();

return 0;

}

int prime(long int pr)

{

int i;

j=sqrt(pr);

for(i=2;i<=j;i++)

{

if(pr%i==0)

return 0;

}

return 1;

}

void ce()

{

int k;

k=0;

for(i=2;i<t;i++)

{

if(t%i==0)

continue;

flag=prime(i);

if(flag==1&&i!=p&&i!=q)

{

e[k]=i; flag=cd(e[k]);

if(flag>0)

{

d[k]=flag;

k++;

}

if(k==99)

break;

}

}

}

long int cd(long int x)

{

long int k=1;

while(1)

{

k=k+t;

if(k%x==0)

return(k/x);

}

}

void encrypt()

{

long int pt,ct,key=e[0],k,len;

i=0;

len=strlen(msg);

while(i!=len)

{

pt=m[i];

pt=pt-96;

k=1;

for(j=0;j<key;j++)

{

k=k\*pt;

k=k%n;

}

temp[i]=k;

ct=k+96;

en[i]=ct;

i++;

}

en[i]=-1;

printf("\nTHE ENCRYPTED MESSAGE IS\n");

for(i=0;en[i]!=-1;i++)

printf("%c",en[i]);

}

void decrypt()

{

long int pt,ct,key=d[0],k;

i=0;

while(en[i]!=-1)

{

ct=temp[i];

k=1;

for(j=0;j<key;j++)

{

k=k\*ct;

k=k%n;

}

pt=k+96;

m[i]=pt;

i++;

}

m[i]=-1;

printf("\nTHE DECRYPTED MESSAGE IS\n");

for(i=0;m[i]!=-1;i++)

printf("%c",m[i]);

}

A picture containing text

Description automatically generated

Text

Description automatically generated with medium confidence

Text

Description automatically generated

**Output:**

Text

Description automatically generated