**PROGRAM 11**

import java.util.\*;

import java.io.\*;

public class P11\_RSA {

static int gcd(int m,int n)

{ while(n!=0)

{ int r=m%n;

m=n;

n=r;

}

return m;

}

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

// TODO code application logic here

int p=0,q=0,n=0,e=0,d=0,phi=0;

int nummes[]=new int[100];

int encrypted[]=new int[100];

int decrypted[]=new int[100];

int i=0,j=0,nofelem=0;

Scanner sc=new Scanner(System.in);

String message ;

System.out.println("Enter the Message to be encrypted:");

message= sc.nextLine();

System.out.println("Enter value of p and q:");

p=sc.nextInt();

q=sc.nextInt();

n=p\*q;

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

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

if(gcd(i,phi)==1) break;

e=i;

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

if((e\*i-1)%phi==0)

break;

d=i;

for(i=0;i<message.length();i++)

{

char c = message.charAt(i);

int a =(int)c;

nummes[i]=c-96;

}

nofelem=message.length();

for(i=0;i<nofelem;i++)

{

encrypted[i]=1;

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

encrypted[i] =(encrypted[i]\*nummes[i])%n;

}

System.out.println("Encrypted message:");

for(i=0;i<nofelem;i++)

{

System.out.print(encrypted[i]);

System.out.print((char)(encrypted[i]+96));

}

for(i=0;i<nofelem;i++)

{ decrypted[i]=1;

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

decrypted[i]=(decrypted[i]\*encrypted[i])%n;

}

System.out.println("\nDecrypted message: ");

for(i=0;i<nofelem;i++)

System.out.print((char)(decrypted[i]+96));

return;

}

}