

```

import java.util.Scanner;
public class Main
{
    public static void main(String[] args)
    {
        Main rsa=new Main();
        int p = 0,q = 0;
        Scanner in=new Scanner(System.in);
        System.out.println("Enter the message to be encrypted: ");
        String message=in.nextLine();
        char[] msgA=message.toCharArray();
        boolean check=false;
        while(!check)
        {
            System.out.println("Enter two prime numbers: ");
            p=in.nextInt();
            q=in.nextInt();
            if(checkPrime(p) && checkPrime(q)) check=true;
        }
        int n=p*q;
        int z=(p-1)*(q-1); int e = 0;
        for(int i=2;i<z;i++)
        {
            if(rsa.gcd(i,z)==1)
            {
                e=i; break;
            }
        }
        System.out.println("The value of e: "+e);
        System.out.println("Public key: (" +e+", " +n+)");
        int d=0;
        for(d=2;d<z;d++)
            if((e*d)%z==1)
                break;
        System.out.println("d: " +d);
        int ch;
        int[] a=new int[message.length()];
        int[] c=new int[message.length()];
        int t=0;
        for(int i=0;i<message.length();i++)

        {
            ch=(int)msgA[i]; a[i]=ch;
            t=1;
            for(int j=0;j<e;j++)
                t=(t*ch)%n;
            c[i]=t;
        }
        System.out.println("Message ASCII Cipher");
    }
}

```

```
for(int i=0;i<message.length();i++)  
System.out.println(" "+msgA[i]+"\\t "+a[i]+"\\t "+c[i]);
```

```
System.out.println("Message Cipher");  
for(int i=0;i<message.length();i++)  
System.out.print(c[i]);
```

```
char cha[]=new char[message.length()];  
System.out.println("\\nDecrypting...");  
for(int i=0;i<message.length();i++)  
{  
    ch=c[i]; t=1;  
    for(int j=0;j<d;j++)  
        t=(t*ch)%n;  
    cha[i]=(char)t;  
}  
System.out.println(new String(cha));  
}  
public int gcd(int a,int b)  
{  
    if(b==0)  
        return a; return gcd(b,a%b);  
}  
public static boolean checkPrime(int num1)  
{  
    if(num1==0 || num1==1)  
        return false; else if(num1==2)  
        return true; for(int i=2;i<num1;i++)  
        if(num1%i==0)  
            return false;  
        return true;  
}  
}
```