Prog 7. Write a program for simple RSA algorithm to encrypt and decrypt the data.

Soln:

```
import java.util.*;
public class p1 {
static int gcd(int m,int n) {
while(n!=0) {
int r=m%n;
m=n;
n=r;
}
return m;
}
public static void main(String args[])  {
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\n");
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) {
e=i;
break;
}
}
for(i=2;i<phi;i++) {
if((e*i-1)%phi==0) {
d=i;
break;
}
}
for(i=0;i<message.length();i++) {
char c = message.charAt(i);
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("\nEncrypted message\n");
for(i=0;i<nofelem;i++) {
System.out.print(encrypted[i]+ " ");
}
```

```
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\n ");
for(i=0;i<nofelem;i++) {
System.out.print((char)(decrypted[i]+96));
}
}
}
```