b) Substitution Cipher

PROGRAM:

```
import java.io.*;
import java.util.*;
public class SubstitutionCipher {
static Scanner sc = new Scanner(System.in);
static BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
public static void main(String[] args) throws IOException {
        // TODO code application logic here
      String a = "abcdefghijklmnopqrstuvwxyz";
      String b = "zyxwvutsrqponmlkjihgfedcba";
System.out.print("Enter any string: ");
      String str = br.readLine();
      String decrypt = "";
char c;
for(int i=0;i<str.length();i++)
         {
            c = str.charAt(i);
int j = a.indexOf(c);
decrypt = decrypt+b.charAt(j);
         }
System.out.println("The encrypted data is: " +decrypt);
    }
}
```

Output:

Enter any string: aceho

The encrypted data is: zxvsl

a) Hill Cipher

PROGRAM:

```
 import java.io.*;
import java.util.*;
import java.io.*; public
class HillCipher {
static float[][] decrypt = new float[3][1];
static float[][] a = new float[3][3]; static
float[][] b = new float[3][3]; static
float[][] mes = new float[3][1]; static
float[][] res = new float[3][1];
static BufferedReader br = new BufferedReader(new
InputStreamReader(System.in)); static Scanner sc = new Scanner(System.in);
public static void main(String[] args) throws IOException {
        // TODO code application
logic here getkeymes();
for(int i=0;i<3;i++) for(int j=0;j<1;j++)
for(int k=0;k<3;k++) {
res[i][j]=res[i][j]+a[i][k]*mes[k][j]; }
System.out.print("\nEncrypted string is :
"); for(int i=0;i<3;i++) {
System.out.print((char)(res[i][0]%26+97));
res[i][0]=res[i][0];

        }
inverse();
for(int i=0;i<3;i++)
for(int j=0;j<1;j++)
for(int k=0;k<3;k++) {
decrypt[i][j] = decrypt[i][j]+b[i][k]*res[k][j]; }
System.out.print("\nDecrypted string is : ");
```

```
for(int i=0;i<3;i++){
System.out.print((char)(decrypt[i][0]%26+97));
        }
System.out.print("\n");
   }
public static void getkeymes() throws IOException {
System.out.println("Enter 3x3 matrix for key (It should be inversible): ");
for(int i=0;i<3;i++)
for(int j=0;j<3;j++)
a[i][j] = sc.nextFloat();
System.out.print("\nEnter a 3 letter string: ");
        String msg = br.readLine();
for(int i=0;i<3;i++)
mes[i][0] = msg.charAt(i)-97;
   }
public static void inverse() {
floatp,q;
float[][] c = a;
for(int i=0;i<3;i++)
for(int j=0;j<3;j++) {
                //a[i][j]=sc.nextFloat();
if(i==j)
b[i][j]=1;
else b[i][j]=0;
            }
for(int k=0;k<3;k++) {
for(int i=0;i<3;i++) {
                p = c[i][k];
                q = c[k][k];
for(int j=0;j<3;j++) {
if(i!=k) {
```

```
c[i][j] = c[i][j]*q-p*c[k][j];
b[i][j] = b[i][j]*q-p*b[k][j];
                    }}}}
for(int i=0;i<3;i++)
for(int j=0;j<3;j++) {
b[i][j] = b[i][j]/c[i][i]; }

System.out.println("");
System.out.println("\nInverse Matrix is : ");
for(int i=0;i<3;i++) {
for(int j=0;j<3;j++)
System.out.print(b[i][j] + " ");
System.out.print("\n"); }
        }}
```

Output:

```
Enter a 3 letter string: hai
Encrypted string is :fdx
Inverse Matrix is :
0.083333336 0.41666666  -0.33333334
-0.41666666 -0.083333336  0.6666667
0.5833333 -0.083333336  -0.33333334
Decrypted string is: hai
```