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#Rutvik Parmar

#H-41

#Date – 8th Feb 2016

#Assignement No:4 - Hill Cipher implementation 3X3 Matrix

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import java.io.\*;

import java.util.\*;

import java.io.\*;

public class hill {

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() {

float p,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 -

Rutviks-MacBook-Pro:~ rutvikparmar$ java hill

Enter 3x3 matrix for key (It should be inversible):

2 5 6

1 0 8

3 9 5

Enter a 3 letter string: hai

Encrypted string is : ktj

Inverse Matrix is :

-14.4 5.8 8.0

3.8 -1.6 -2.0

1.8 -0.6 -1.0

Decrypted string is : hai