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**CLASS: BECSEII**

**ROLL:63**

**AIM: WRITE A JAVA PROGRAM TO IMPLEMENT HILL CIPHER**

-------------------------------------------------------------------------

import java.util.\*;

class HillCipher {

Scanner sc = new Scanner(System.in);

char alphabets[] = new char[26];

String input = new String();

int [][]key;

String ciphertext = new String();

String plaintext = new String();

int vector[][];

int len=0;

int rows,cols;

String cipherstring="";

HillCipher(){

int i;

char j;

for(i=0,j='A';i<26;i++,j++){

alphabets[i] = j;

}

}

void getInputs(){

System.out.println("\nEnter the Input String To Be Encrypted");

input = sc.nextLine();

input = input.toUpperCase();

}

String multiply(int a[][],int b[][]){

int c[][] = new int[rows][1];

for(int i=0;i<rows;i++){

for(int j=0;j<1;j++){

c[i][j]=0;

for(int k=0;k<rows;k++)

{

c[i][j]+=a[i][k]\*b[k][j];

}

}

}

int x;

String res="";

for(int i=0;i<rows;i++){

for(int j=0;j<1;j++){

x = c[i][j];

x = x % 26;

res+= String.valueOf(x);

}

res+=" ";

}

return res.trim();

}

void setVectors(){

len= input.length();

int j=0;

if(len%2 == 1){

input+="X";

}

for(int i=0;i<(input.length())/2;i++){

for(int k=0;k<rows;k++){

vector[k][0] = getIndex(input.charAt(j));

j+=1;

}

cipherstring += multiply(key,vector);

cipherstring+=" ";

}

String cipherarr[] = cipherstring.split("\\s+");

// for(int i=0;i<cipherarr.length;i++){

// System.out.print(cipherarr[i] +" ");

// }

for(int i=0;i<cipherarr.length;i++){

ciphertext+=getChar(Integer.parseInt(cipherarr[i]));

}

System.out.println("\n" + input+ " is Encrypted to " +ciphertext);

System.out.println("\n" + ciphertext +" is Decrypted to " +input);

}

void getKey(){

System.out.println("\nEnter Rows in Key Matrix");

rows = sc.nextInt();

System.out.println("Enter Columns in Key Matrix");

cols = sc.nextInt();

key = new int[rows][cols];

vector = new int[rows][1];

System.out.println("Enter the Matrix Contents Row-Wise");

for(int i=0;i<rows;i++){

for(int j=0;j<cols;j++){

key[i][j] = sc.nextInt();

}

}

System.out.print("\nKey is : \n");

for(int i=0;i<rows;i++){

for(int j=0;j<cols;j++){

System.out.print(key[i][j] + " ");

}

System.out.println();

}

setVectors();

}

int getIndex(char ch){

int temp = (int)ch;

int tmp=0;

int temp\_integer = 64;

if(temp<=90 & temp>=65)

{

tmp = temp - temp\_integer - 1;

return tmp;

}

return 0;

}

char getChar(int ch){

return alphabets[ch];

}

}

class HillCipherFurkhan {

public static void main(String args[]){

HillCipher hc = new HillCipher();

hc.getInputs();

hc.getKey();

}

}

--------------------------------------------------------

**+++++OUTPUT+++++**

**Enter the Input String To Be Encrypted**

**goodmorning**

**Enter Rows in Key Matrix**

**2**

**Enter Columns in Key Matrix**

**2**

**Enter the Matrix Contents Row-Wise**

**3 5**

**2 7**

**Key is :**

**3 5**

**2 7**

**GOODMORNINGX is Encrypted to KGFXCSMVLDDR**

**KGFXCSMVLDDR is Decrypted to GOODMORNINGX**