**Kushal Parikh – 201612008**

**ISS LAB 1 & 2**

**LAB -1**

**Program – 1**

/\* package codechef; // don't place package name! \*/

import java.util.\*;

import java.lang.\*;

import java.io.\*;

/\* Name of the class has to be "Main" only if the class is public. \*/

class Codechef

{

public static void main (String[] args) throws java.lang.Exception

{

Scanner sc = new Scanner(System.in);

String str = sc.nextLine();

//int key = sc.next();

int key = Integer.parseInt(sc.next());

int asc;

String coded = "";

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

asc = str.charAt(i);

if(asc >= 65 && asc <= 91 ){

asc -= 65;

asc = (asc + key) % 26;

asc += 65;

coded += (char)asc;

}

else if(asc >= 97 && asc <= 122){

asc -= 97;

asc = (asc + key) % 26;

asc += 97;

coded += (char)asc;

}

else if(asc == 32){

coded += (char)asc;

}

}

System.out.println(coded);

}

}

**Prog – 2**

/\* package codechef; // don't place package name! \*/

import java.util.\*;

import java.lang.\*;

import java.io.\*;

/\* Name of the class has to be "Main" only if the class is public. \*/

class Codechef

{

public static void main (String[] args) throws java.lang.Exception

{

Scanner sc = new Scanner(System.in);

String str = sc.nextLine();

//int key = sc.next();

int key = Integer.parseInt(sc.next());

int asc;

String coded = "";

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

asc = str.charAt(i);

if(asc >= 65 && asc <= 90 ){

asc -= 65;

asc = (asc - key);

if(asc<0)

asc+=26;

asc = asc% 26;

asc += 65;

coded += (char)asc;

}

else if(asc >= 97 && asc <= 122){

asc -= 97;

asc = (asc - key);

if(asc<0)

asc+=26;

asc = asc% 26;

asc += 97;

coded += (char)asc;

}

else if(asc == 32){

coded += (char)asc;

}

}

System.out.println(coded);

}

}

**Prog – 3**

/\* package codechef; // don't place package name! \*/

import java.util.\*;

import java.lang.\*;

import java.io.\*;

/\* Name of the class has to be "Main" only if the class is public. \*/

class Codechef

{

public static void main (String[] args) throws java.lang.Exception

{

Scanner sc = new Scanner(System.in);

String str = sc.nextLine();

//int key = sc.next();

//int key = Integer.parseInt(sc.next());

int asc;

String coded = "";

int key;

for(key=1;key<=26;key++){

coded = "";

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

asc = str.charAt(i);

if(asc >= 65 && asc <= 90 ){

asc -= 65;

asc = (asc + key) % 26;

asc += 65;

coded += (char)asc;

}

else if(asc >= 97 && asc <= 122){

asc -= 97;

asc = (asc + key) % 26;

asc += 97;

coded += (char)asc;

}

else if(asc == 32){

coded += (char)asc;

}

}

System.out.println(coded + " " + key);

}

}

}

**LAB – 2**

public class AfineCipher {

static int a = 5;

static int b = 8;

public static void main(String[] args) {

// String str = "ABC";

String str = "AFFINE CIPHER";

System.out.println("Plain Text : " + str);

String encrypt = encryptCipher(str);

System.out.println("Encrypted : " + encrypt);

String decrypt = decryptCipher(encrypt);

System.out.println("Decrypted : " + decrypt);

bruteForceAttack(decrypt);

}

public static String encryptCipher(String str) {

String encrypt = new String();

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

if (str.charAt(i) == ' ')

encrypt += " ";

else {

int x = str.charAt(i) - 65;

int key = (a \* x) + b;

encrypt += (char) ((key % 26) + 65) + "";

}

}

return encrypt;

}

public static String decryptCipher(String str) {

String decrypt = "";

int x = 0;

for (int i = 1;; i++) {

if ((a \* i) % 26 == 1) {

x = i;

break;

}

}

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

if (str.charAt(i) == ' ')

decrypt += " ";

else {

int k = str.charAt(i) - 65;

int temp = x \* (k - b);

if (temp % 26 < 0) {

decrypt += (char) (((temp % 26) + 26) + 65);

} else {

decrypt += (char) (((temp % 26)) + 65);

}

}

}

return decrypt;

}

public static void bruteForceAttack(String str) {

System.out.println("Possible Plain texts are ");

int cnt = 0;

int array[] = { 1, 3, 5, 7, 9, 11, 15, 17, 19, 21, 23, 25 };

for (int tmp : array) {

a = tmp;

for (int j = 1; j <= 26; j++) {

b = j;

System.out.println(decryptCipher(str));

cnt++;

}

}

System.out.println("Total " + cnt + " possibilities");

}

}