**NAME: FURKHAN MUJIBODDEN SHAIKH**

**CLASS: BECSEII**

**ROLL:63**

**AIM: WRITE A JAVA PROGRAM TO CALCULATE MULTIPLICATIVE INVERSE**

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

import java.util.\*;

class monoCipher {

Scanner sc = new Scanner(System.in);

char alphabets[] = new char[26];

char cipherbets[] = new char[26];

String input = new String();

String key;

String ciphertext = new String();

String plaintext = new String();

monoCipher(){

int i;

char j;

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

alphabets[i] = j;

}

}

boolean check(char ch){

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

if(ch == cipherbets[i]){

return true;

}

}

return false;

}

void setCipherAlphabets(){

int cnt=0;

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

cipherbets[i] = key.charAt(i);

}

for(int j=0;j<26;j++){

if(check(alphabets[j])){

continue;

}

else{

if((key.length()+cnt) < 26)

{

cipherbets[key.length()+cnt] = alphabets[j];

cnt+=1;

}

}

}

}

void getInputs(){

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

input = sc.nextLine();

input = input.toUpperCase();

// System.out.println(input);

}

void getKey(){

System.out.println("\nEnter the Key");

key = sc.nextLine();

key = key.toUpperCase();

// System.out.print(key);

}

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;

}

int getIndexInCipherBets(char ch){

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

if(ch == cipherbets[i]){

return i;

}

}

return -1;

}

void cipher(){

System.out.print("\nOpen Alphabet : ");

for(int j=0;j<26;j++){

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

}

System.out.println();

System.out.print("Cipher Alphabet : ");

for(int j=0;j<26;j++){

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

}

System.out.println();

int index;

ciphertext = "";

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

if(Character.isLetter(input.charAt(i))){

index = getIndex(input.charAt(i));

ciphertext+=Character.toString(cipherbets[index]);

}

else{

ciphertext += input.charAt(i);

}

}

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

}

void decrypt(){

System.out.print("\nCipher Alphabet : ");

for(int j=0;j<26;j++){

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

}

System.out.println();

System.out.print("Open Alphabet : ");

for(int j=0;j<26;j++){

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

}

System.out.println();

int index;

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

if(Character.isLetter(ciphertext.charAt(i))){

index = getIndexInCipherBets(ciphertext.charAt(i));

plaintext+=Character.toString(alphabets[index]);

}

else{

plaintext += input.charAt(i);

}

}

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

}

}

class monoAlphabeticCipher {

public static void main(String args[]){

monoCipher mc = new monoCipher();

mc.getInputs();

mc.getKey();

mc.setCipherAlphabets();

mc.cipher();

mc.decrypt();

}

}

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

**Program Calculates Multiplicative Inverse of M % N**

**Enter the Value of M**

**5678**

**Enter the Value of M**

**8765**

**Multiplicative Inverse of 5678 % 8765 is 2527**