Program 6 (a): Write a java program to implement the following SUBSTITUTION &TRANSPOSITION

TECHNIQUES concepts: a) Caesar Cipher

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// Java implementation of Substitution Cipher

import java.io.*;

import java.util.*;

import java.util.HashMap;

import java.util.Map;


public class CaesarCipher {

    public static void main(String[] args) {

        String allLetters = "abcdefghijklmnopqrstuvwxyzABCDEFGHI" +
"JKLMNOPQRSTUVWXYZ";


        // create a dictionary to store the substitution for the given alphabet in the plain text
based on the key

        Map<Character, Character> dict1 = new HashMap<>();

        int key = 4;

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

            dict1.put(allLetters.charAt(i),

                    allLetters.charAt((i + key) % allLetters.length()));

        }


        String plainText = "I am studying Data Encryption";

        StringBuilder cipherText = new StringBuilder();


        // loop to generate ciphertext

        for (char c : plainText.toCharArray()) {

            if (allLetters.indexOf(c) != -1) {

                cipherText.append(dict1.get(c));

            } else {
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            cipherText.append(c);
        }
    }

    System.out.println("Cipher Text is: " + cipherText);

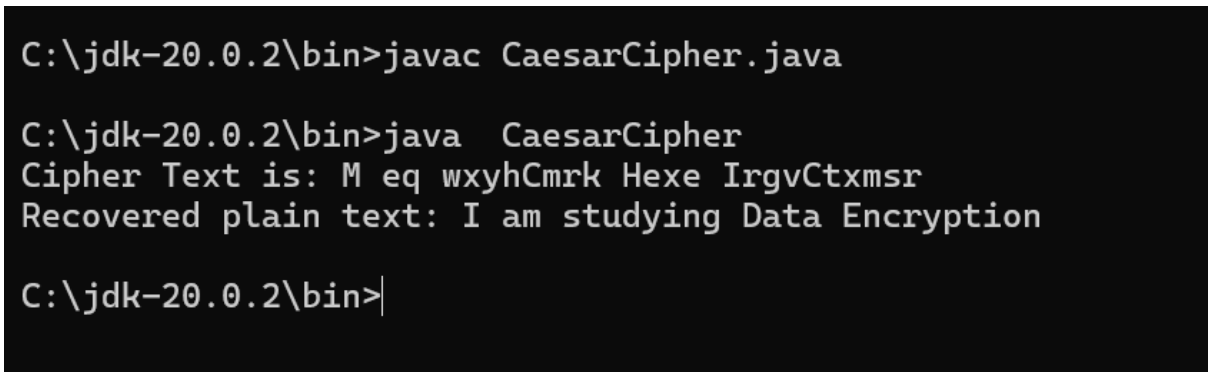
    // create a map to store the substitution for the given alphabet in the cipher text based on the key
    Map<Character, Character> dict2 = new HashMap<>();
    for (int i = 0; i < allLetters.length(); i++) {
        dict2.put(allLetters.charAt(i),
                allLetters.charAt((i - key + allLetters.length()) % allLetters.length()));
    }

    StringBuilder decryptedText = new StringBuilder();

    // loop to recover plain text
    for (char c : cipherText.toString().toCharArray()) {
        if (allLetters.indexOf(c) != -1) {
            decryptedText.append(dict2.get(c));
        } else {
            decryptedText.append(c);
        }
    }

    System.out.println("Recovered plain text: " + decryptedText);
  }
}
```

output:


C:\jdk-20.0.2\bin>javac CaesarCipher.java
C:\jdk-20.0.2\bin>java CaesarCipher
Cipher Text is: M eq wxyhCmrk Hexe IrgvCtxmsr
Recovered plain text: I am studying Data Encryption
C:\jdk-20.0.2\bin>