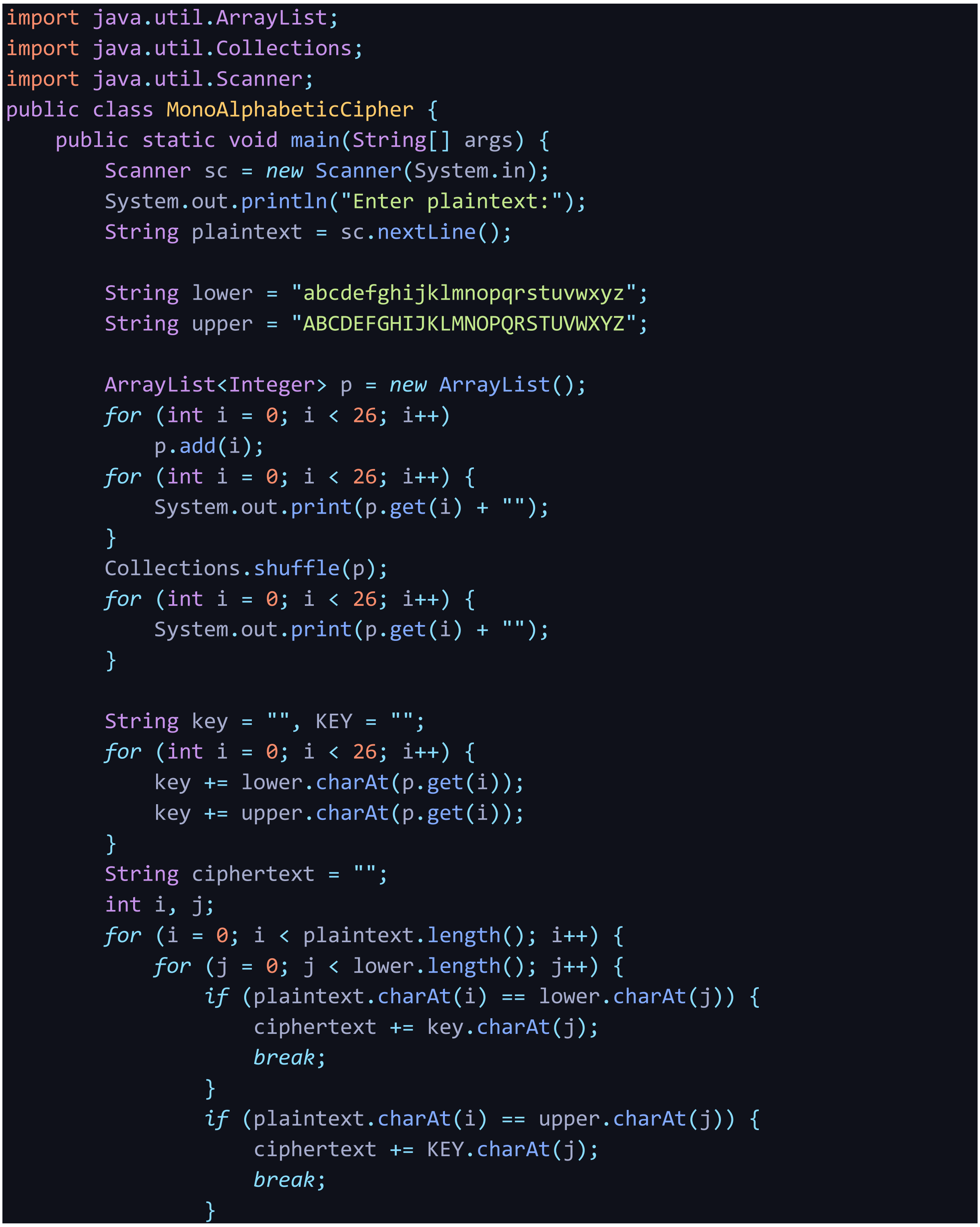
PRACTICAL 1

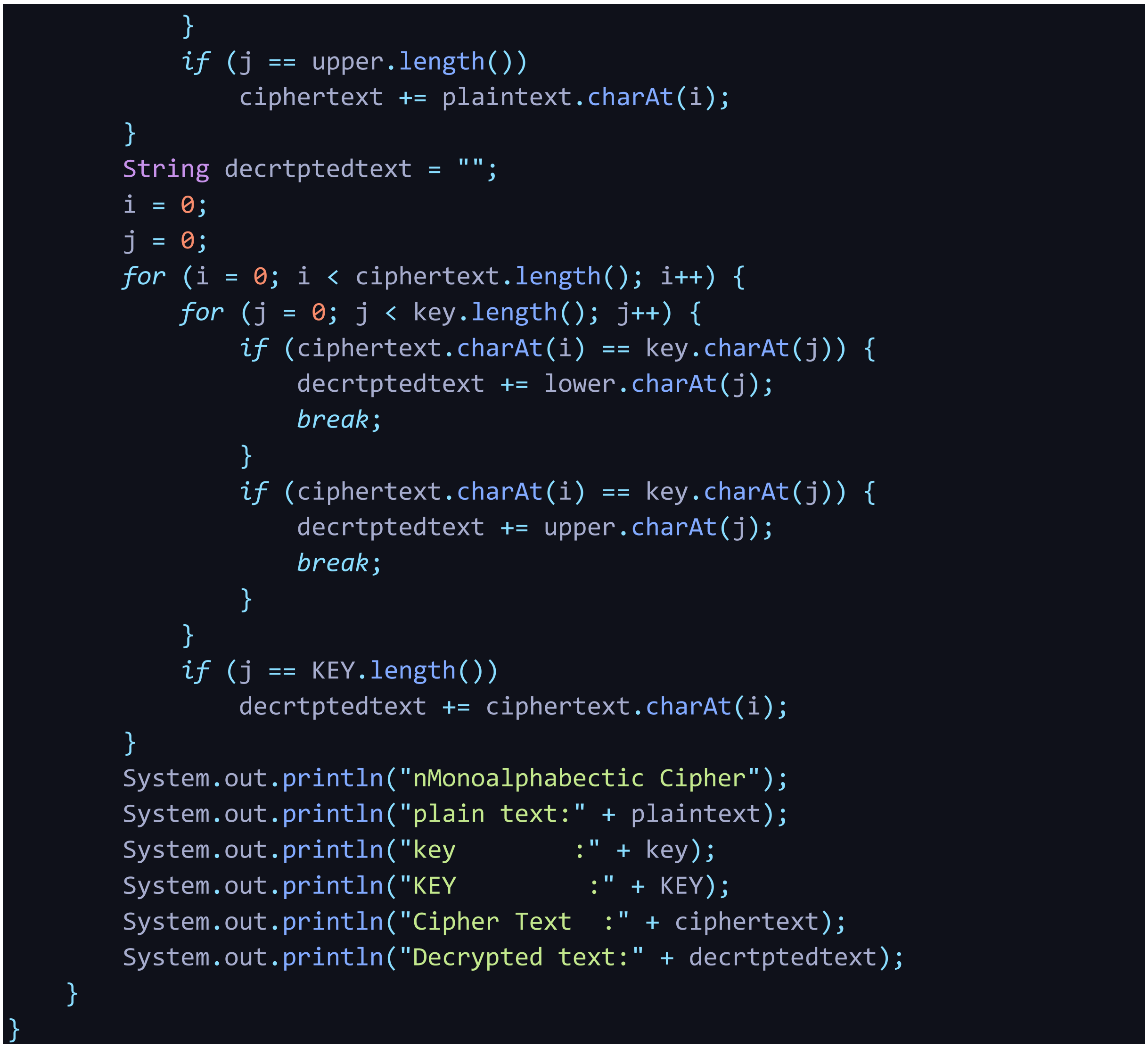
Aim: Write programs to implement the following Substitution Cipher Techniques: - Caesar Cipher , Monoalphabetic Cipher.

MonoAlphabeticCIpher

Code:



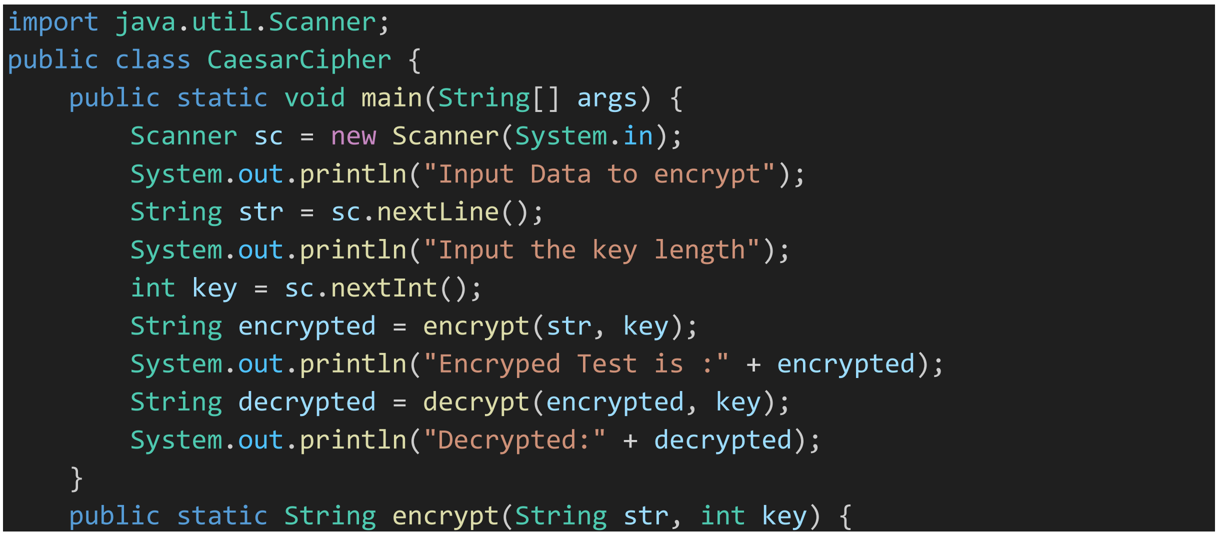
```java
import java.util.ArrayList;
import java.util.Collections;
import java.util.Scanner;
public class MonoAlphabeticCipher {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter plaintext:");
        String plaintext = sc.nextLine();

        String lower = "abcdefghijklmnopqrstuvwxyz";
        String upper = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";

        ArrayList<Integer> p = new ArrayList();
        for (int i = 0; i < 26; i++)
            p.add(i);
        for (int i = 0; i < 26; i++) {
            System.out.print(p.get(i) + "");
        }
        Collections.shuffle(p);
        for (int i = 0; i < 26; i++) {
            System.out.print(p.get(i) + "");
        }

        String key = "", KEY = "";
        for (int i = 0; i < 26; i++) {
            key += lower.charAt(p.get(i));
            key += upper.charAt(p.get(i));
        }
        String ciphertext = "";
        int i, j;
        for (i = 0; i < plaintext.length(); i++) {
            for (j = 0; j < lower.length(); j++) {
                if (plaintext.charAt(i) == lower.charAt(j)) {
                    ciphertext += key.charAt(j);
                    break;
                }
                if (plaintext.charAt(i) == upper.charAt(j)) {
                    ciphertext += KEY.charAt(j);
                    break;
                }
```



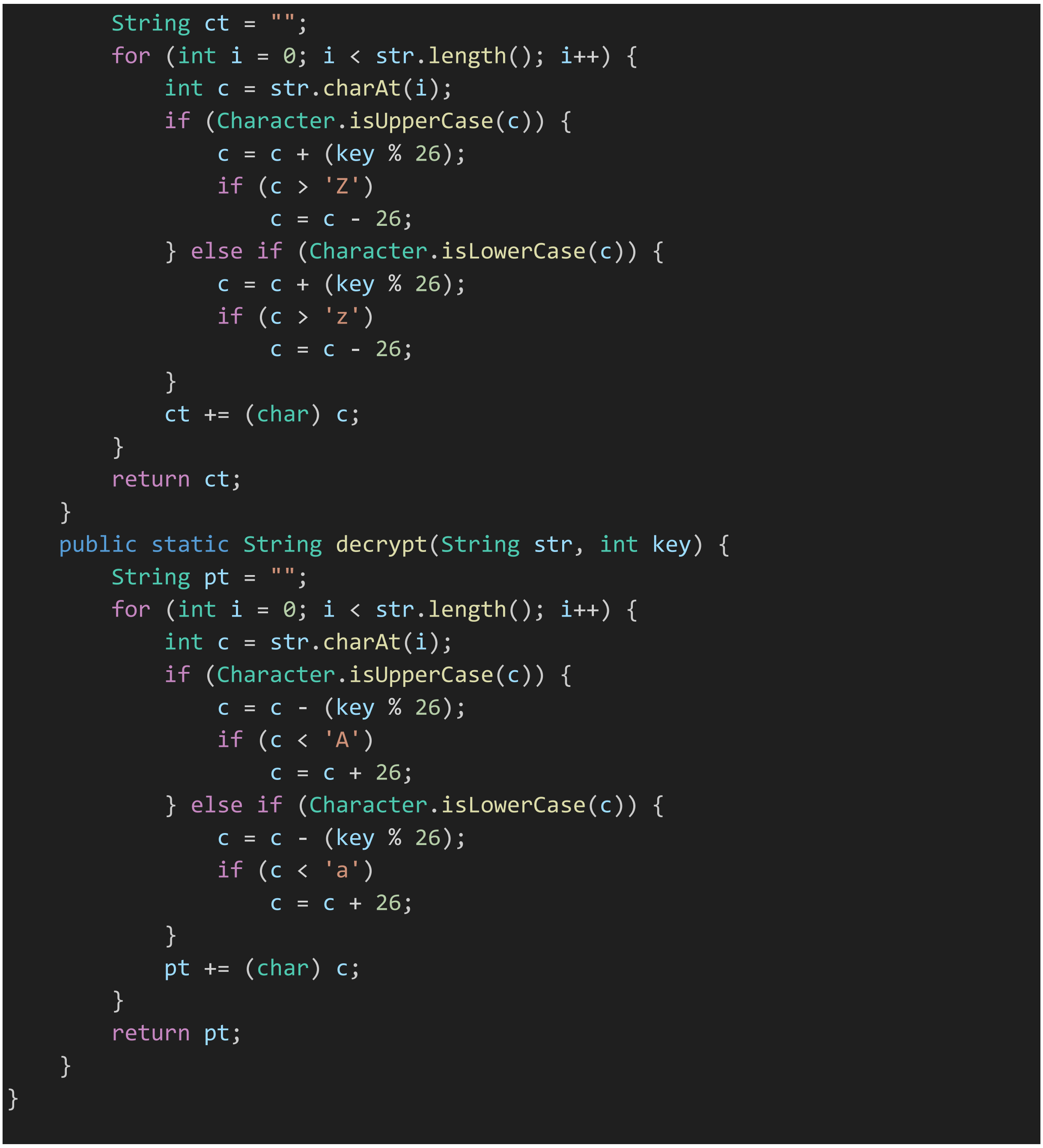
```
            }
            if (j == upper.length())
                ciphertext += plaintext.charAt(i);
        }
        String decrtptedtext = "";
        i = 0;
        j = 0;
        for (i = 0; i < ciphertext.length(); i++) {
            for (j = 0; j < key.length(); j++) {
                if (ciphertext.charAt(i) == key.charAt(j)) {
                    decrtptedtext += lower.charAt(j);
                    break;
                }
                if (ciphertext.charAt(i) == key.charAt(j)) {
                    decrtptedtext += upper.charAt(j);
                    break;
                }
            }
            if (j == KEY.length())
                decrtptedtext += ciphertext.charAt(i);
        }
        System.out.println("nMonoalphabectic Cipher");
        System.out.println("plain text:" + plaintext);
        System.out.println("key        :" + key);
        System.out.println("KEY         :" + KEY);
        System.out.println("Cipher Text  :" + ciphertext);
        System.out.println("Decrypted text:" + decrtptedtext);
    }
}
```

CaesarCipher

Code:

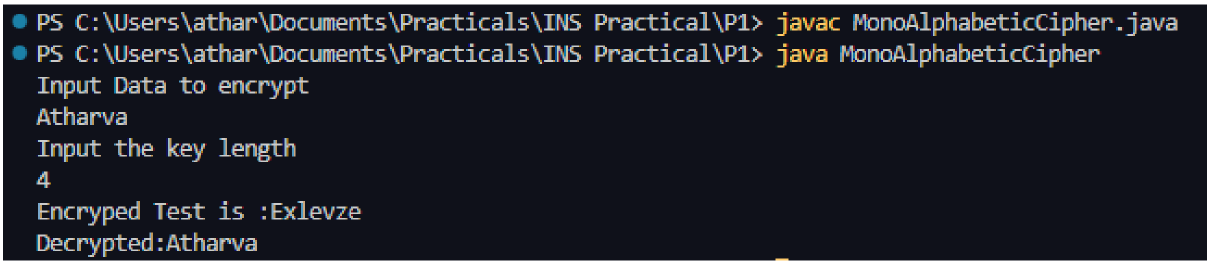


```
import java.util.Scanner;
public class CaesarCipher {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Input Data to encrypt");
        String str = sc.nextLine();
        System.out.println("Input the key length");
        int key = sc.nextInt();
        String encrypted = encrypt(str, key);
        System.out.println("Encryped Test is :" + encrypted);
        String decrypted = decrypt(encrypted, key);
        System.out.println("Decrypted:" + decrypted);
    }
    public static String encrypt(String str, int key) {
```



```
        String ct = "";
        for (int i = 0; i < str.length(); i++) {
            int c = str.charAt(i);
            if (Character.isUpperCase(c)) {
                c = c + (key % 26);
                if (c > 'Z')
                    c = c - 26;
            } else if (Character.isLowerCase(c)) {
                c = c + (key % 26);
                if (c > 'z')
                    c = c - 26;
            }
            ct += (char) c;
        }
        return ct;
    }
    public static String decrypt(String str, int key) {
        String pt = "";
        for (int i = 0; i < str.length(); i++) {
            int c = str.charAt(i);
            if (Character.isUpperCase(c)) {
                c = c - (key % 26);
                if (c < 'A')
                    c = c + 26;
            } else if (Character.isLowerCase(c)) {
                c = c - (key % 26);
                if (c < 'a')
                    c = c + 26;
            }
            pt += (char) c;
        }
        return pt;
    }
}
```

Output:



```
PS C:\Users\athar\Documents\Practicals\INS Practical\P1> javac MonoAlphabeticCipher.java
PS C:\Users\athar\Documents\Practicals\INS Practical\P1> java MonoAlphabeticCipher
Input Data to encrypt
Atharva
Input the key length
4
Encryped Test is :Exlevze
Decrypted:Atharva
```