

**Case-Study: Lab Task 20/04/2021**

**Programming Fundamentals (Java)**

**Registration # Fa20-Bse-094**

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**Instructions**

In today’s Lab Task you have to understand and modify the

Case Study 7.8: Counting the Occurrences of Each Letter, you have to implement the code for

* Upper Case letters (A-Z),
* lowercase letters(a-z) and
* Numeric digits (0-9).

Upload your Solution and Running program screen shot.

**Source Code:**

package Russi7kd;

import java.util.\*;

public class Case\_Study\_Random\_Family {

public static void main(String[] args) {

// Declare and create an array

char[] chars = createArray('a');

// Display the array For Lower Case

System.out.println("The lowercase letters are:");

//Display array for lower case letters

displayArray(chars);

// Count the occurrences of each letter

int[] counts = countLetters(chars, 'a');

// Display counts

System.out.println();

System.out.println("The occurrences of small letters are:");

displayCounts(counts,'a');

System.out.println("\n======================================");

// Declare and create an array for Upper Case

char[] charsUpper = createArray('A');

// Display the array for Upper Case Letter

System.out.println("\nThe Uppercase letters are:");

displayArray(charsUpper);

// Count the occurrences of each letter

int[] countUpper = countLetters(charsUpper , 'A');

// Display counts

System.out.println();

System.out.println("The occurrences of capital letters are:");

displayCounts(countUpper,'A');

System.out.println("\n======================================");

// Declare and create an array for Digits

char[] charsDigits = createArray('0');

// Display the array

System.out.println("\nThe random Digits are:");

displayArray(charsDigits);

// Count the occurrences of each letter

int[] countDigits = countLetters(charsDigits , '0');

// Display counts

System.out.println();

System.out.println("The occurrences of digits are:");

displayCounts(countDigits,'0');

}

/\*\* Create an array of characters \*/

public static char[] createArray(char a) {

// Declare an array of characters and create it

char[] nullList = new char[10];

char[] charsLower = new char[100];

char[] charsUpper = new char[100];

char[] charsDigits = new char[100];

// Create lowercase letters randomly and assign

// them to the array

if (a == 'a'){

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

charsLower[i] = randomCharacterLower();

return charsLower;

}

if (a == 'A'){

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

charsUpper[i] = randomCharacterUpper();

return charsUpper;

}

if (a == '0'){

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

charsDigits[i] = randomNumber();

// System.out.println(charsUpper[i]);

}

return charsDigits;

}

return nullList;

}

/\*\* Display the array of characters \*/

public static void displayArray(char[] chars) {

// Display the characters in the array 20 on each line

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

if ((i + 1) % 20 == 0)

System.out.println(chars[i]);

else

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

}

}

/\*\* Count the occurrences of each letter \*/

public static int[] countLetters(char[] chars , char s) {

// Declare and create an array of 26 int

int[] nullList = new int[10];

int[] countsLower = new int[26];

int[] countsUpper = new int[26];

int[] countsDigits = new int[10];

// For each lowercase letter in the array, count it

if(s == 'a'){

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

countsLower[chars[i] - 'a']++;

return countsLower;

}

// For each uppercase letter in the array, count it

else if (s == 'A'){

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

countsUpper[chars[i] - 'A']++;

return countsUpper;

}

// For each digit letter in the array, count it

else if (s == '0'){

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

countsDigits[chars[i] - '0']++;

return countsDigits;

}

return nullList;

}

/\*\* Display counts Family\*/

public static void displayCounts(int[] counts , char a) {

if(a == 'a')

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

if ((i + 1) % 10 == 0)

System.out.println(counts[i] + " " + (char)(i + 'a'));

else

System.out.print(counts[i] + " " + (char)(i + 'a') + " ");

}

if(a == 'A')

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

if ((i + 1) % 10 == 0)

System.out.println(counts[i] + " " + (char)(i + 'A'));

else

System.out.print(counts[i] + " " + (char)(i + 'A') + " ");

}

if(a == '0')

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

if ((i + 1) % 4 == 0)

System.out.println(counts[i] + " times " + (char)(i + '0'));

else

System.out.print(counts[i] + " times " + (char)(i + '0') + " , ");

}

}

// Random Methods Family============================

public static char random(char ch1, char ch2){

return (char)(ch1 + Math.random() \* ( ch2 - ch1 + 1));

}

public static char randomNumber() {

return random('0','9');

}

public static char randomCharacterUpper(){

return random('A','Z');

}

public static char randomCharacterLower(){

return random('a','z');

}

}

**OUTPUT SHOT:**



