Taibah University
College of Computer Science and Engineering (Yanbu)
Spring(2022)
CS112-Programming II
Coursework02

Due Thu 07 Apr 08:00 AM

Instructions

1. You must submit your solution using Blackboard. **Email submissions will not be accepted**. Blackboard can be accessed from the Universitys website using the following address :
   https://lms.taibahu.edu.sa

2. You can discuss answers with your colleagues, but **cheating is prohibited and there will be extreme consequences**.

Problem1
The following Java program reads a word from the user and prints the number of occurrences of each letter in the word. Run CountLetters and enter a phrase, that is, more than one word with spaces or other punctuation in between. It should throw an ArrayIndexOutOfBoundsException, because a non-letter will generate an index that is not between 0 and 25. It might be desirable to allow non-letter characters, but not count them. Of course, you could explicitly test the value of the character to see if it is between 'A' and 'Z'. However, an alternative is to go ahead and use the translated character as an index, and catch an ArrayIndexOutOfBoundsException if it occurs. Since you want don't want to do anything when a non-letter occurs, the handler will be empty. Modify this method to do this as follows:

- Put the body of the first for loop in a try.

- Add a catch that catches the exception, so that it prints a useful message (e.g., "Not a letter").

Listing 1: CountLetters.java

```java
import java.util.Scanner;
```

```java
public class CountLetters{
    public static void main(String[] args)
    {
        int[] counts = new int[26];
        Scanner scan = new Scanner(System.in);
        //get word from user
        System.out.print("Enter a single word (letters only, please): ");
        String word = scan.nextLine();
        //convert to all upper case
        word = word.toUpperCase();
        //count frequency of each letter in string
        for (int i=0; i < word.length(); i++)
            counts[word.charAt(i)-'A']++;

        //print frequencies
        System.out.println();
        for (int i=0; i < counts.length; i++)
            if (counts [i] != 0)
                System.out.println((char)(i +'A') + ": " + counts[i]);
    }
}
```

Solution:

Listing 2: Defining the student class

```java
mport java.util.Scanner;
public class CountLetters{
    public static void main(String[] args)
    {
        int[] counts = new int[26];
        Scanner scan = new Scanner(System.in);
        //get word from user
        System.out.print("Enter a single word (letters only, please): ");
        String word = scan.nextLine();
        //convert to all upper case
        word = word.toUpperCase();
        //count frequency of each letter in string
        for (int i=0; i < word.length(); i++)
            try{
                counts[word.charAt(i)-'A']++;
            }
            catch (ArrayIndexOutOfBoundsException ex){
                System.out.println("Not a letter");
            }
```

```
      //print frequencies
      System.out.println();
      for (int i=0; i < counts.length; i++)
          if (counts [i] != 0)
              System.out.println((char)(i +'A') + ": " + counts[i]);
   }
}
```

Good luck   Sameer M. Alrehaili