

VISUAL BASIC/ C# PROGRAMMING (330)

REGIONAL – 2015

Production Portion:

Program 1: File Statistics _____ (500 points)

TOTAL POINTS _____ (***500 points***)

Failure to adhere to any of the following rules will result in disqualification:

- 1. Contestant must hand in this test booklet and all printouts. Failure to do so will result in disqualification.**
- 2. No equipment, supplies, or materials other than those specified for this event are allowed in the testing area. No previous BPA tests and/or sample tests or facsimile (handwritten, photocopied, or keyed) are allowed in the testing area.**
- 3. Electronic devices will be monitored according to ACT standards.**

No more than ten (10) minutes orientation

No more than 90 minutes testing time

No more than ten (10) minutes wrap-up

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General Instructions

XYZ, Inc. receives and processes submissions for composition contests and essay-based applications from across the nation. The first step in evaluating a submission is to verify that the submission meets the minimum requirements. For example, the maximum number of words allowed for a particular submission may be 500. This initial verification is currently a manual process and is proving to be overly time-consuming. XYZ, Inc. has contracted you to develop a program that will provide statistics about an ASCII text file that contains English composition to help streamline the verification process.

XYZ, Inc. has provided the following requirements:

1. The program must display the total number of ASCII characters in a file.
2. The program must display the total number of words contained in the file. A word is defined as any number of characters bounded by one or more spaces, the newline character, or the beginning or end of a string.
3. The program must display the total number of sentences contained in the file. A sentence is one or more words that end with a period, exclamation mark, or question mark.
4. The number of vowels contained in the file. A vowel can be any of the following: A, E, I, O, U, a, e, i, o, u.

You will have 90 minutes to complete your work.

Your name and/or school name should NOT appear on any work you submit for grading.

Copy your entire solution/project to the flash drive provided. You must submit your entire solution/project so that the graders may open your project to review the source code. You must ensure that the files required to run your program are present and will execute on the flash drive provided. Note that the flash drive letter may not be the same when the program is graded as it was when you created the program. It is recommended that you use relative paths rather than absolute paths to ensure that the program will run regardless of the flash drive letter. The graders **will not** compile or alter your source code to correct for this. Submissions that do not contain source code **will not** be graded.

Assumptions to make when taking this assessment:

- The input file(s) will contain only ASCII characters.
- The count of characters is any ASCII character, regardless if it is visible on the screen or in the file.
- A test input file will be available and will be named, "Student Data 330.txt".

Technical Specifications:

1. Solution and Project

- a. Create a Visual Basic Windows Form Application named VB_330_ContestantNumber, where ContestantNumber is your BPA assigned contestant number. When naming your project, replace dashes (-) with the underscore (_). For example, if your BPA contestant number is 01-2345-6789, then your project name would be VB_330_01_2345_6789.

2. User Interface

- a. The user interface to be constructed is shown in Figure 1. Your application must be visually identical to the prototype shown in Figure 1.
- b. The Main Form
 - i. The form is to be a Single Document Interface
 - ii. The name of the main form should be frmMain
 - iii. The Form's caption must be set to "Submission Statistics: Contestant #ABC", where ABC is your BPA assigned contestant number (including dashes)
 - iv. The StartPosition of the form must be set to CenterScreen
- c. User interface elements and default (design-time) property settings
 - i. Exit Button
 1. The name of this button must be cmdExit
 2. The text property for this button must be set to "E&xit"
 - ii. Clear Button
 1. The name of this button must be cmdClear
 2. The text property for this button must be set to "Clear"
 3. The Enabled property for this button must be set to False
 - iii. Process Button
 1. The name of this button must be "cmdProcess"
 2. The text property for this button must be set to "Process"
 3. The Enabled property for this button must be set to False
 - iv. Choose File Button
 1. The name of this button must be "cmdChooseFile"
 2. The text property for this button must be set to "Choose File"
 - v. File Name Textbox
 1. The name of this textbox must be "txtFileName"
 2. The ReadOnly property for this textbox must be set to True
 - vi. Group Boxes
 1. A group box called, "grpFileContents" must be created and must contain the textboxes and associated labels for: Characters, words, sentences, and vowels
 2. A group box called, "grpActions" must be created and must contain the buttons for: process, clear, and exit

- vii. File Contents Textbox
 - 1. The name of this textbox must be “txtFileContents”
 - 2. The ReadOnly property for this textbox must be set to True
 - 3. The Multiline property for this textbox must be set to True
 - 4. The Scrollbars property for this textbox must be set to Vertical
- viii. Character Count Textbox
 - 1. The name of this textbox must be “txtCharacterCount”
 - 2. The ReadOnly property for this textbox must be set to True
- ix. Word Count Textbox
 - 1. The name of this textbox must be “txtWordCount”
 - 2. The ReadOnly property for this textbox must be set to True
- x. Sentence Count Textbox
 - 1. The name of this textbox must be “txtSentenceCount”
 - 2. The ReadOnly property for this textbox must be set to True
- xi. Vowel Count Textbox
 - 1. The name of this textbox must be “txtVowelCount”
 - 2. The ReadOnly property for this textbox must be set to True
- xii. Labels must be created as shown in Figure 1
 - 1. All labels must be prefixed with “lbl”. For example, lblCharacters is the label name for the label with the text “Characters” in Figure 1

3. Tasks (see Table 1 below)

- a. Close the Application Button Click
 - i. Closes the form. Upon closing, the application must confirm that the form is to be closed and allow the user to cancel the close by responding with “No” to the question, “Do you wish to exit this application?” If the user responds with a “Yes”, then the application is closed.
 - ii. The dialog box used to solicit the response must contain the message, “Do you wish to exit this application?” with a caption of “Exit?”
 - iii. The dialog box used to solicit the response must contain two buttons: Yes and No.
- b. Clear the Form Button Click
 - i. Clears all output fields by setting them to the value vbNullString
 - ii. Fields to set to vbNullString: txtFileName, txtCharacterCount, txtWordCount, txtSentenceCount, and txtVowelCount.
 - iii. Disable the clear button
 - iv. Disable the process button

- c. Process a File Button Click
 - i. Opens the file contained in txtFileName for input
 - ii. Read the contents of the file into the txtFileContents control for on-screen display
 - iii. Count the characters in the file and display the count in txtCharacterCount
 - iv. Count the words in the file and display the count in txtWordCount
 - v. Count the sentences in the file and display the count in txtSentenceCount
 - vi. Count the vowels in the file and display the count in txtVowelCount
 - vii. Enable the clear button
 - viii. Enable the process button
- d. Choose a File Button Click
 - i. Uses the Open File Dialog object to browse for a file to read
 - ii. The Open File Dialog object's filter property must be set to "Text files (*.txt)|*.txt" or "*.txt|*.txt"

Task	Object	Event
Close the Application	Exit Button	Click
Clear the Form	Clear Button	Click
Process a File	Process Button	Click
Choose a File	Choose File Button	Click

Table 1 - Task-Object-Event Chart

Development Standards

- Standard name prefixes must be utilized for forms, controls, and variables.
- All subroutines, functions, and methods must be documented with comments explaining the purpose of the method, the input parameters (if any), and the output (if any).
- The user interface must be similar to Figure 1.

User Interface Design

Submission Statistics: Contestant #01-2345-6789

File Name:

File Details

Characters:

Words:

Sentences:

Vowels:

Actions

File Contents:

Figure 1

Your application will be graded on the following criteria:

Solution and Project

The project is present on the flash drive _____ 10 pts
The project is named according to the naming conventions _____ 10 pts

User Interface - Property Checks

The user interface design resembles Figure 1 _____ 20 pts
The name of the form is, "frmMain" _____ 5 pts
The form's caption displays "Submission Statistics: Contestant #ABC",
where #ABC is the contestant's properly formatted BPA ID _____ 5 pts
The user interface's Start Position is set to "CenterScreen" _____ 5 pts

The user interface contains a button named, "cmdExit" _____ 5 pts
The user interface contains a button captioned, "E&xit" _____ 5 pts

The user interface contains a button named, "cmdClear" _____ 5 pts
The user interface contains a button captioned, "Clear" _____ 5 pts
The enabled property for this button must be set to False _____ 5 pts

The user interface contains a button named, "cmdProcess" _____ 5 pts
The user interface contains a button captioned, "Process" _____ 5 pts
The enabled property for this button must be set to False _____ 5 pts

The user interface contains a button named, "cmdChooseFile" _____ 5 pts
The user interface contains a button captioned, "Choose File" _____ 5 pts

The user interface contains a textbox called, "txtFileName" _____ 5 pts
The "txtFileName" textbox's ReadOnly property is set to True _____ 5 pts

The user interface contains a textbox called, "txtFileContents" _____ 5 pts
The "txtFileContents" textbox's ReadOnly property is set to True _____ 5 pts
The "txtFileContents" textbox's Multiline property is set to True _____ 5 pts
The "txtFileContents" textbox's Scrollbars property is set to Vertical _____ 5 pts

The user interface contains a textbox called, "txtCharacterCount" _____ 5 pts
The "txtCharacterCount" textbox's ReadOnly property is set to True _____ 5 pts

The user interface contains a textbox called, "txtWordCount" _____ 5 pts
The "txtWordCount" textbox's ReadOnly property is set to True _____ 5 pts

The user interface contains a textbox called, "txtSentenceCount" _____ 5 pts
The "txtSentenceCount" textbox's ReadOnly property is set to True _____ 5 pts

The user interface contains a textbox called, "txtVowelCount" _____ 5 pts
The "txtVowelCount" textbox's ReadOnly property is set to True _____ 5 pts

The following labels are present: "File Name", "Characters",
"Words", "Sentences", and Vowels" (2 point each) _____ 10 pts

Runtime Checks

Code copied to USB drive and program runs from the USB drive _____ 10 pts

If the program does not execute, then the remaining items in this section receive a score of zero

When pressed, the cmdClear button clears the contents of the
txtCharacterCount, txtWordCount, txtSentenceCount, txtVowelCount,
and txtFileContents textboxes (2 point each) _____ 10 pts

When pressed, the cmdProcess button processes the selected file
and populates the txtCharacterCount, txtWordCount, txtSentenceCount,
txtVowelCount, and txtFileContents textboxes (20 points each) _____ 100 pts

After the cmdProcess button is pressed, the cmdClear button is
Enabled _____ 10 pts

When pressed, the cmdClear button clears both the txtEnglish and the
txtMorseCode textboxes (5 points each) _____ 10 pts

When pressed, the cmdChooseFile button displays an OpenFileDialog
Screen and allows the user to select a file from the list _____ 20 pts

The open file dialog filter is set to "Text files (*.txt)|*.txt" or "*.txt|*.txt" _____ 15 pts

When pressed, the cmdExit button attempts to close the form _____ 10 pts

When the user attempts to close the application, a confirmation dialog
is presented that confirms that the user wishes to exit the
application _____ 20 pts

Source Code Review

Code is commented at the top, for each function, and as needed _____ 15 pts
Code uses a consistent variable naming convention _____ 15 pts

Code is present to open the input file _____ 20 pts

Code is present to read from the input file _____ 10 pts

Error handling is used to catch and handle errors when opening the file _____ 40 pts

The input file is closed _____ 10 pts

Total Points: 500 pts