Overview (1):
- Before We Begin
  - Some administrative details
  - Some questions to consider
- Manipulation of Strings (Cont.)
  - Example Exercise 5-4
  - Example Exercise 5-5

Administrative Details (1):
- Lab Exercise
  - You should be working on Ex 5-9 this week
    - Due March 6
  - Lab Ex. 4-8 has been graded and will be distributed after the lecture
  - I will be in the Glade Lab today, after the lecture from 2:30-3:30pm
- Test 2 Reminder
  - Wednesday, March 15 2006
  - Don't leave your studying until the last minute!

Before We Begin

Some Questions to Consider (1):
- What is a string?
- How can we determine the length of a string?
- Describe the similarities/differences between a control array and a string
- How can we convert all characters of a string to lower/upper case?
- How can we “reverse” a string?
- Describe the “Mid” function

Manipulation of Strings (cont. from last lecture)
Example: Exercise 5-4 (1):
- Review From Last Lecture
  - Develop a program that requests the user to input a string and then perform some operation with the string depending on which option is selected.

Example: Exercise 5-4 (2):
- Lets Practice Working With Strings (cont.)
  - Simply call the StrReverse function.

Example: Exercise 5-4 (3):
- Lets Practice Working With Strings (cont.)
  - Simply call the StrReverse function.
  - But what about not calling the StrReverse function? Can you think of a way to perform this task without actually calling the function?

Example: Exercise 5-5 (1):
- Spell Checking – The I Before E Rule
  - Develop a program to correct the spelling of words containing "ie" or "ei".
    - Rule → "i before e except after c"
    - Keep in mind the purpose of this exercise is to practice with loops and strings and manipulating strings → the output of this program may not necessarily be correct grammatically!

Example: Exercise 5-5 (2):
- Spell Checking – The I Before E Rule (cont.)
  - Take a look at the user interface below.
    - Text is entered in a Textbox not ListBox!
    - User enters text in the upper Textbox & when the "Check and Correct" button is pressed, the corrected version appears in the lower Textbox.

Example: Exercise 5-5 (3):
- Adding a Scrollbar to a Textbox
  - In this exercise the user will enter the text in the upper Textbox and the corrected text will be displayed in the lower Textbox.
    - But what if the text cannot fit in the Textbox? → we can add a scroll bar to the Textbox.
    - The Textbox object has a property allowing it to have and display scrollbars.
      - Set the MultiLine property to True
      - Set the Scrollbar property to 3- Both
Example: Exercise 5-5 (4):
- Adding a Scrollbar to a TextBox (cont.)

Example: Exercise 5-5 (5):
- Overview of the Solution
  - Declare a String variable and assign it the value from the input textbox
  - Set up a loop that checks for the occurrence of "ei" in the input string
    - If the occurrence of "ei" is not preceded by "c", replace it by "ie"
    - Continue until all occurrences of "ei" have been examined and potentially altered
  - Assign the corrected string to the output TextBox

Example: Exercise 5-5 (6):
- Lets Examine the Required Loop
  - We do not know how many times the letters "ei" occur within our input string,
  - Therefore, we will need a conditional loop
  - Keep in mind that there may not even be a single occurrence of "ei" in the string therefore, we need a Do/While loop → if "ei" does not appear, then we do not want to iterate loop at all
  - What condition will we test for?
    - Before we decide this, let’s look at how we will go about solving the problem in greater detail

Example: Exercise 5-5 (7):
- Lets Examine the Required Loop (cont.)
  - What functions do we have available that will help us in solving our problem?
  - InStr(Start(Integer, optional), String1, String2)
    - This function returns a Long specifying the position of the first occurrence of "String2" in "String1", starting at "Start" if specified, otherwise at the beginning of "String1" (e.g., at character 1)
    - If no occurrence of "String2" in "String1" then 0 is returned

Example: Exercise 5-5 (8):
- Lets Examine the Required Loop (cont.)
  - How about the following condition for our conditional loop → InStr(txtInput, "ei") > 0
    - Assuming "ei" does not appear the input string (denoted by "txtInput"), then the loop will not execute at all
    - If it does occur then it will execute but as written above, it will never end since it will always find the first occurrence of "ei" within txtInput
    - Need to find the first occurrence, then the second etc.

Example: Exercise 5-5 (9):
- Lets Examine the Required Loop (cont.)
  - But remember that the InStr function allows us to specify an argument indicating where in the input string the search should begin!
  - Consider the following code:
    ```vbnet
    position = 1
    Do While (InStr(position, txtInput, "iei") > 0)
        position = InStr(position, txtInput, "iei")
        char = Mid(txtInput, position - 1, 1)
        result = StrComp(char, "c") + StrComp(char, "C")
        If (result = 0) Then
            ' Perform the necessary actions here to replace "ei" with "ie"
        End If
    Loop
    ```
Example: Exercise 5-5 (10):
- Let's Examine the Required Loop (cont.)
  - Consider the following input: "Conceive a piece plan"
  - On the first iteration, position has the value 1
  - First statement within the loop assigns five to it
  - Statement following "If" makes position = 6
  - During second iteration, the InStr function looks for next "ei" occurring after character 6.
  - Returns 13 and the loop body is executed again
  - Position is assigned 13, then after the If block it is assigned 14 and repeats again → loop condition will now be False since InStr returns 0

Example: Exercise 5-5 (11):
- Replacing One Occurrence of the Substring
  - We want to now replace (where appropriate) the occurrence of "ei" with "ie" once again, let's consider the functions we have available to us
  - Replace(String1, String2, String3, Start(Long - optional), Count (optional))
    - Returns a string with "String2" replaced by "String3" where ever it is found in "String1", beginning at the position "Start" or replaces it "Count" times from position Start
    - If Start is not specified then 0 is assumed

Example: Exercise 5-5 (12):
- Replacing An Occurrence of the Substring
  - Must be careful when we use the Replace function since, if used as shown below, all occurrences of "ei" will be replaced by "ie"
    - txtInput = Replace(txtInput, "ei", "ie")
    - May not necessarily be what we want! Therefore, replacement needs to occur one at a time
  - What about the following
    - Replace(txtInput, "ei", "ie", position, 1)?
    - Still not sufficient! → Will truncate characters in return string that are before "Start"

Example: Exercise 5-5 (13):
- Replacing An Occurrence of the Substring
  - So if characters occurring before "position" are truncated, how can we perform the intended task?
    - Use the Mid function → Obtain characters before "position" using the Mid function then concatenate them to result of calling Replace

See course website for complete solution to this problem

Example: Exercise 5-5 (14):
- Putting it All Together
  - You should now be able to, on your own, complete Ex. 5-5 and in fact, it's a good idea to actually do so
  - Good preparation for Ex. 5-9 that must be submitted
  - Of course, once you complete the program, test it with various input strings
  - I will make my solution available online

CSE 1530 Winter 2006
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