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Visual Basic

Text and Strings

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String Functions

Visual Basic offers many functions that can operate on string variables.

The examples on this page assume you have made the following declaration.

```
Dim myString As String
myString = "Programming is fun"
```

Length of a String

The Length property returns the number of characters in the string.

```
n = myString.Length()
```

In this case, the variable n would be set to 18 since there are 18 characters in "Programming is fun".
Note: spaces are counted as characters.

Changing Case

To change all the characters in a string to uppercase ...

```
myString.ToUpper()
```

To change all the characters in a string to lowercase ...

```
myString.ToLower()
```

Removing Spaces

To delete spaces at the beginning of a string ...

```
myString.TrimStart()
```

To delete spaces at the end of a string ...

```
myString.TrimEnd()
```

To delete spaces at the beginning and end of a string ...

```
myString.Trim()
```

Adding Spaces

You can use `PadLeft` and `PadRight` to add spaces (or any other character) to the start or end of a string.

```
myString = myString.PadLeft(___, " ")
```

Total Length of the new string.

Note: This is NOT how many characters you want to add.

Character to add. In this case, a space.

String Functions

Accessing Individual Characters

Chars is an array of characters that holds all the characters in the string. You can use this property to read individual characters from a string based on their location in the string (the index of the first character in the array is zero). The Chars array is read-only, and you can't edit a string by setting individual characters.

```
Dim myString As String
Dim myChar As Char
```

To get the first character of myString use ...

```
myChar = myString.Chars(0)
```

To get the second character of myString use ...

```
myChar = myString.Chars(1)
```

To get the third character of myString use ...

```
myChar = myString.Chars(2)
```

To get the last character of myString use ...

```
myChar = myString.Chars
                (myString.Length() - 1)
```

Note: Put this all on one line.

Char Methods

Several methods exist that allow the programmer to test certain properties of a character.

```
Dim myChar As Char
```

You can check if the character is a letter, a digit, uppercase, lowercase, etc.

```
Char.IsLetter(myChar)

Char.IsDigit(myChar)

Char.IsLetterOrDigit(myChar)

Char.IsLower(myChar)

Char.IsUpper(myChar)

Char.IsNumber(myChar)
```

Substrings

Substring returns a new string that is a substring of the original string.

The substring begins at the specified index and extends up to the specified length.

```
myString.Substring(___, ___)
```

Starting location

How many characters to extract.

Note: Recall that the first character in the string is in position "0", not "1".

If you want to take the first 5 characters of a string ...

```
myString.Substring(0, 5)
```

If you want to take the third to seventh characters of a string, use ...

```
myString.Substring(2, 5)
```

If you want to take the last character of a string ...

```
myString.Substring(myString.Length - 1, 1)
```

If you want to take the last 5 characters of a string ...

```
myString.Substring(myString.Length - 5, 5)
```

String Functions Examples

Searching for Characters

The following example uses a **For-Next** loop to search a string for the letter "a".

```
Dim myString As String
Dim found As Boolean

myString = "Programming is Fun"
found = False

For i = 0 to myString.Length() - 1

      If myString.Chars(i) = "a" then found = True

Next i
```

We can modify the program to check for uppercase A's as well ...

```
      If myString.Chars(i) = "a" or myString.Chars(i) = "A" then found = True
```

Validating a Password

The following function allows the user to create a password that follows the following rules:

- Must be at least 6 characters
- Must be only numbers and letters

The program assumes that the user has typed the password in TextBox1.

```
Dim password As String
Dim i As Integer
Dim valid As Boolean

password = TextBox1.Text
valid = True    'assume the password is valid

If password.Length < 6 Then
    MessageBox.Show("The password must be at least 6 characters long.")
    valid = false
    Exit Sub
End If

For i = 0 To password.Length - 1

    If Not Char.IsLetterOrDigit(password.Substring(i, 1)) Then valid = False

Next

If valid = False Then MessageBox.Show("Password must be only letters or digits.")
```

TextBox Control - Sample Code

Toggle Bold Text Using a CheckBox

You can use a CheckBox (with the **Appearance** property set to **Button**) to turn Bold on and off (toggle) in a TextBox.

```
If CheckBox1.Checked = True Then
    TextBox1.Font = New Font(TextBox1.Font, TextBox1.Font.Style + FontStyle.Bold)
Else
    TextBox1.Font = New Font(TextBox1.Font, TextBox1.Font.Style - FontStyle.Bold)
End If
```

You can do the same with other font properties such as: FontStyle.Italic, FontStyle.Strikeout, FontStyle.Underline

Adjusting Font Size with a ComboBox

Assuming we have a ComboBox Control populated with numbers (ie. 8, 10, 12, 14, 18, 24, 36, 72).

In Form | Load, type:

```
ComboBox1.Items.Add(8)
ComboBox1.Items.Add(10)
ComboBox1.Items.Add(12)
```
etc.

In the ComboBox1 | SelectedIndexChanged, type:

```
TextBox1.Font = New Font(TextBox1.Font.FontFamily, ComboBox1.SelectedItem)
```

Setting up a "Font" ComboBox

This will get all of the available fonts on the computer and add them to the ComboBox2.

In Form | Load, type:

```
Dim f As System.Drawing.Text.InstalledFontCollection = New System.Drawing.Text.InstalledFontCollection

For Each FontFamily In f.Families
   ComboBox2.Items.Add(FontFamily.Name)
Next
```

In the ComboBox2 | SelectedIndexChanged, type:

```
TextBox1.Font() = New Font(ComboBox2.SelectedItem.ToString, ComboBox1.SelectedItem)
```

Using the FontDialog Control

You can use the FontDialog Control to set many font properties. Begin by adding the FontDialog Control to your Form.

```
FontDialog1.ShowDialog()
TextBox1.Font = FontDialog1.Font
```

Undo

```
If TextBox1.CanUndo Then
   TextBox1.Undo()
End If
```

Select All

```
TextBox1.SelectAll()
```

Using the Clipboard with Text

The Clipboard - Cut

```
My.Computer.Clipboard.Clear()

If TextBox1.SelectionLength > 0 Then TextBox1.Cut()
```

The Clipboard - Copy

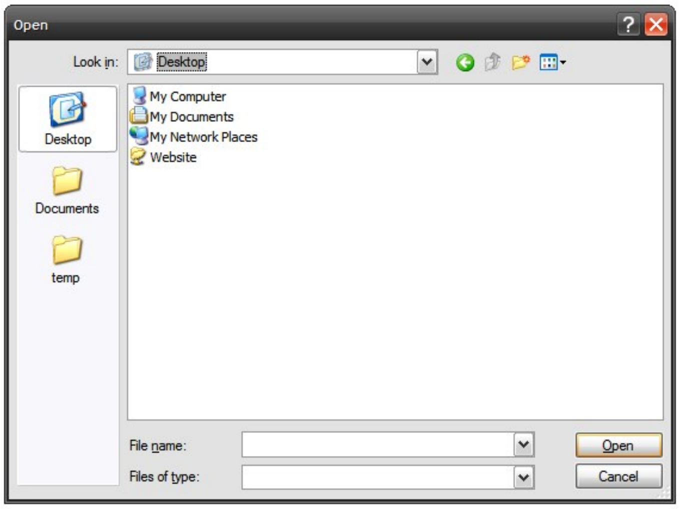
```
My.Computer.Clipboard.Clear()

TextBox1.Copy()
```

The Clipboard - Paste

```
If My.Computer.Clipboard.ContainsText Then TextBox1.Paste()
```

OpenFileDialog Control



Visual Basic provides several dialog controls to facilitate coding and keep your programs consistent with other Windows applications.

The OpenFileDialog box displays a dialog that allows a user to change drives and folders and select a file.

Note: When you add the OpenFileDialog control to your Form, it will appear in a special area below the Form (it will not appear on the actual Form).

To display the OpenFileDialog control ...

```
OpenFileDialog.Show()
```

To determine the file the user selected ...

```
OpenFileDialog.FileName
```

To determine what type of files you want to display, use the **Filter** property ...

Example. Show only text (.TXT) files.

```
OpenFileDialog.Filter = "Text Files (*.txt)|*.txt"
```

The blue text is what the user will see.

The orange text is what the computer will search for.

This character is usually above the [ENTER] key on the keyboard.

Example. Show web page files (can be .HTML or .HTM)

```
SaveFileDialog1.Filter = "HTML Files (*.htm, *.html)|*.htm;*.html"
```

Example. Show text files and web page files.

```
SaveFileDialog1.Filter = "HTML Files (*.htm, *.html)|*.htm;*.html|
            Text Files (*.txt)|*.txt"
```

Note: Put all this on one line.

SaveFileDialog Control

The **SaveFileDialog** control works almost identically to the OpenFileDialog control.

Writing Text to a File

The following code is from "**Mr. G's HTML Editor 2009**".

The name of the document is stored in a string variable named **HTMLFileName**.

A boolean variable named **dirty** determines if the text has been modified since the last time the document was saved. This variable is set to **False** whenever a new document is started, a document is opened, or immediately after a document is saved. In `TextBox1.TextChanged`, the variable is set to **True**.

In the "Save" Command button ...

```
If HTMLFileName = "untitled.html" Then

    SaveFileDialog1.Filter = "HTML Files (*.htm, *.html)|*.htm;*.html|
            Text Files (*.txt)|*.txt"

    SaveFileDialog1.FileName = HTMLFileName
    SaveFileDialog1.ShowDialog()

    HTMLFileName = SaveFileDialog1.FileName
    Me.Text = "Mr. G's HTML Editor - " + HTMLFileName

End If

My.Computer.FileSystem.WriteAllText(HTMLFileName, TextBox1.Text, False)

TextBox1.Focus()

dirty = False
```

Note: Put all this on one line.

In TextBox1 | TextChanged ...

```
dirty = True
```

Reading Text from a File

The following code is from "**Mr. G's HTML Editor 2009**".

The name of the document is stored in a string variable named **HTMLFileName**.

A boolean variable named **dirty** determines if the text has been modified since the last time the document was saved. This variable is set to **False** whenever a new document is started, a document is opened, or immediately after a document is saved. In `TextBox1.TextChanged`, the variable is set to **True**.

In the "Open" Command button ...

```
'Check if the text in the TextBox has been modified

If dirty = True Then

    'If the text of notepad changed, the program will ask the
    'user if they want to save the changes

    response = MessageBox.Show("Do you want to save the changes?",
            "Open Document", MessageBoxButtons.YesNoCancel)
```

Note: Put all this on one line.

```
    If response = DialogResult.Cancel Then Exit Sub

    If response = DialogResult.Yes Then

        SaveFileDialog1.Filter = "HTML Files (*.htm, *.html)|*.htm,*.html|
                  Text Files (*.txt)|*.txt"
```

Note: Put all this on one line.

```
        SaveFileDialog1.FileName = HTMLFileName
        SaveFileDialog1.ShowDialog()

        My.Computer.FileSystem.WriteAllText(SaveFileDialog1.FileName,
                  TextBox1.Text, False)
```

Note: Put all this on one line.

```
        TextBox1.Clear()

    End If

End If

OpenFileDialog1.Filter = "HTML Files (*.htm, *.html)|*.htm;*.html|
                  Text Files (*.txt)|*.txt"
```

Note: Put all this on one line.

```
OpenFileDialog1.FileName = ""
OpenFileDialog1.ShowDialog()

If OpenFileDialog1.FileName = "" Then Exit Sub

TextBox1.Text = My.Computer.FileSystem.ReadAllText(OpenFileDialog1.FileName)
TextBox1.Focus()

HTMLFileName = OpenFileDialog1.FileName
Me.Text = "Mr. G's HTML Editor - " + HTMLFileName

dirty = False
```

Text and Strings Exercises

______________________________	______________________________
Name	Date

Given the string … `myString = "Hello, how are you ?"` … what do the following return …

myString.subString(0, 1)	______________________
myString.subString(0, 3)	______________________
myString.subString(7, 3)	______________________
myString.subString(myString.Length() - 1, 1)	______________________
myString.subString(myString.Length() - 5, 5)	______________________

What **substring( )** statement would yield the following results …

"how"	myString.subString(_____, _____)
"are"	myString.subString(_____, _____)
"yo"	myString.subString(_____, _____)

State the command that …

… returns the **length** (number of characters) of a string	______________________
… converts all characters in a string to uppercase	______________________
… converts all characters in a string to lowercase	______________________
… removes leading spaces from the start of a string	______________________
… removes trailing spaces from the end of a string	______________________
… removes leading and trailing spaces from a string	______________________