**Computer Programming – Calculator Assignment**

35 points

This assignment requires you to create a calculator. With any assignment you create, it is imperative that you give the program the exact name that I request. If you don’t, when I look in your home directory and I can’t find the **CALCULATOR** program, it will not get graded and you will receive a zero. I won’t search through your home directory, trying to figure out what you might have called an assignment.

**Program Details**

1. Your program should be called **Calculator**.
2. The form should look like below left. The objects used to build it are displayed in below right.

1. You should do your best to replicate this form as closely as possible to what you see. Some hints for properties and values to use are:
	1. Font – Tahoma, size 16, bold
	2. Text Align – Center Middle
	3. Backcolor – Black (for horizontal answer bar)
	4. Borderstyle – Fixed Single or Fixed 3D
	5. Text: Match the text found in the above images. Match capitalization.
	6. Size – You will have to resize various objects, including the form inself. You can either drag the handles in the corners of the objects, or type in values for Width and Height in the Size property. The form’s width is 392, and the height is 336.
2. Object details
	1. Labels
		1. Label1 – Holds the program name
		2. Label2 – A static (doesn’t change) label that asks the user to enter the top number.
		3. Label3 - A static (doesn’t change) label that asks the user to enter the bottom number.
		4. Label4 – Displays the user’s first number in the visual equation on the right side of form.
		5. Label5 - Displays the user’s second number in the visual equation on the right side of form.
		6. Label6 – A narrow label, filled in black, used to create a horizontal answer bar.
		7. Label7 – A label used in the visual formula to represent the operation chosen by user. This should change to + for addition, - for subtraction, X for multiplication, and ÷ (ALT + 0247) for Division.
		8. Label8 – The answer will appear here, as part of the visual equation. It should appear in a font and size identical to the rest of the equation.
	2. Textboxes
		1. Textbox1 – The user will be allowed to enter the top number of the equation here.
		2. Textbox2 – The user will be allowed to enter the bottom number of the equation here.
	3. Buttons
		1. Button1 – This button will be used to make the program calculate the answer for the user chosen math problem.
		2. Button2 – This button will be used to reset the calculator back to its initial state.
	4. Main Menu – You will create a horizontal menu that the user will use to choose the mathematical operation they wish to perform. (Addition, Subtraction, Multiplication, Division)
3. Variables – We are going to store user input and answers in certain variables. Use DIM to declare.
	1. **num1** (integer) – This will store the user’s top number. (From Textbox1)
	2. **num2**(integer) – This will store the user’s bottom number. (From Textbox2)
	3. **answer**(integer) – This will store the answer to the addition, multiplication, and subtraction problems.
	4. **Danswer**(double) – This will store the answer to the division problems.
4. Events
	1. Textbox1.TextChanged – If the text changes in the textbox, the variables num1 and num2 should be set.
	2. Button1.Click – When the buttons are clicked, the appropriate operation is performed on the user’s numbers.
	3. Button2.Click – resets the text of all labels back to the default. It should also reset the variable values.
	4. Menuitem1.click – There should be four events for the four menus, which when clicked, will change the symbol in the formula, as well as the operation that will be performed.
5. Code
	1. Declare the variables shown above. The name and type are provided. Example: **DIM X AS INTEGER**
	2. Capturing a textbox value and putting it into a variable – Example: **X = Val(Textbox4.text)**
	3. Statically assigning a value to a variable or property.value - Examples:
		1. X = 0
		2. Label3.text = “Invalid input.” (remember that text must be in quotes)
		3. Label6.text =”The answer is “ & answer
	4. Formulas – Example - X = Y + Z X = Y – Z X = Y \* Z X = Y / Z
	5. IF….THEN – These are the condition statements that will have the program move in different directions based on the conditions. In this program, we want to use this to determine the operation that will be performed on the user’s numbers.
6. Testing/Troubleshooting – You want to make sure that your program is completely functional.
	1. Test all four operations and make certain that they work.
	2. Make sure you can reset the program.
	3. Is there something that you do that causes the program to do something unexpected? (user-proof)
	4. I will typically have a pretty thorough testing method to see if your program can handle values and events that may not be anticipated. You should do the same.