IST 256
Lab Week 3, Part 1 – January 26, 2009

1. Testing Arithmetic and String Operators

For this application, you should open Visual Studio 2008 and create a new project named something like TestArith. Refer back to the instructions from previous labs for how to do this. This new project should be in the same lab projects folder that you created on your H: drive last time.

In the **initial form**, change the Text property of the form for the new Test Arithmetic project so that the form box has a nice header label.

This application will have three sections on the form. The first section will be used to test how the arithmetic operators work on Integers, the second section will test how the arithmetic operators work on Singles, and the third section will work with Strings.

Each of the three sections should look something like the following sketch and as demonstrated in class:

```
First       |____________________|          | Compute  | (Button1)
Second      |____________________|          | Integers |

Result      |____________________|          |   Clear  | (Button2)
```

This one section of the program has three Labels, three TextBoxes, and two Buttons. These objects can be copied and pasted to the two sections below it for testing the other types.

Section 1: Write the code for testing Integer arithmetic in Buttons 1 and 2

For the Compute Integers button, write the program that

Declares three variables named first, second, and result as type Integer
Get values for first and second from TextBox1 and TextBox2.
Add the two numbers and assign it to the variable result.
Put the result value into TextBox3.

For the Clear button, write the program that

Assigns the empty string "" to all three textboxes

Test for Input Errors:

Start with the operator +, as demonstrated in class. Now run the program and click the Compute Integer button without typing any number. What happens?

Now run the program again, and instead of typing a valid Integer, type a Single – for example, type 3.6 in the first TextBox and type 2.2 in the second TextBox. What happens?

What happens if you type Hello in the first TextBox?

Test the Integer Operators +, -, *, \ : For the remaining tests, put the operator into the program line that computes with the first and second number and assigns it to result. Then run the program with two different sets of numbers and write your results on this paper. For each operator, in the first set of numbers, the first number should be bigger than the second, but in the second set of numbers, the first number should be smaller than the second. Negative numbers can be used. The first two sets of numbers are filled in for you – you can pick the remaining ones to test.

Integer Operator	First Integer	Second Integer	Result
+	9	5	
+	-5	9	
-			
-			
*			
*			
\			
\			
Mod			

Extra: What happens if you use / on Integers such as 11 / 3?

Section 2: Testing Singles

Copy all the Labels, TextBoxes and Buttons to make a second section. Change the label of the first button to Compute Singles. Observe the names of the TextBoxes and Buttons.

Write programs for the two buttons: First copy and paste the code from Button1 (Compute Integers) to Button3 (Compute Singles). Change the type of the variables to be Singles and change the names of the TextBoxes. For the Clear button, copy the code from before and change the names of the TextBoxes.

Test for Input Errors:

Start with the operator + as before. Now run the program and click the Compute Singles button without typing any number. What happens?

Now run the program again, and instead of typing a valid Single, type an Integer – for example, type 6 in the first TextBox and 2 in the second TextBox. What happens?

What happens if you type Hello in the first TextBox?

Test the Single Operators +, -, *, /: For the remaining tests, put the operator into the program line that computes with the first and second number and assigns it to result. Then run the program with two different sets of numbers and write your results on this paper. For each operator, in the first set of numbers, the first number should be bigger than the second, but in the second set of numbers, the first number should be smaller than the second, except for the Exponent operator.

Single Operator	First Single	Second Single	Result
+	2.5	5.0	
+	-5.0	9.655	
-			
-			
*			
*			
/			
/			
^	4.0	2	
^	4.0	3	

Section 3: Testing Strings

Make a third section by copying all the Labels, TextBoxes and Buttons as before. Change the label of the first button to Compute Strings. Observe the names of the TextBoxes and Buttons.

Write programs for the two buttons as before, changing the types of the variables to String and the names of the TextBoxes as necessary. Change the String operator to &.

Test for Normal Input:

Run the program, typing in two Strings and write down the result. In one of your examples, use alphabetic characters. In another of your examples, be sure to use numbers, such as those suggested on the second line here.

String Operator	First String	Second String	Result
&			
&	5	4	

Test for Input Errors:

Run the program again with the & operator and click the Compute String button without typing any strings in the boxes. What happens?

Now run the program again, and instead of typing character Strings, type numbers, either Integer or Single in the TextBoxes. What happens?

When you have completed your testing, wait for the discussion at the end of class. Save this lab paper to hand in with Wednesday's lab.