Introduction to Visual Basic I

Topics

- Get familiar with the VS Express 2013 environment
- String and number variables
- Assignment statements
- Evaluating expressions
- User input: strings and numbers
- New material for students to learn via online resources: Using format strings in Visual Basic

A straightforward program

1. Launch the **RAPTOR** software and use it to create and save a new program called `StraightforwardProgram_Part1.rap` inside the folder `StraightforwardProgram` inside of your lab folder.

   Complete `StraightforwardProgram_Part1.rap` so that it prompts the user to input a first name and a last name (using two input symbols) and outputs to the *MasterConsole* a single line containing the full name input by the user formatted as below (for input `John Miller`):

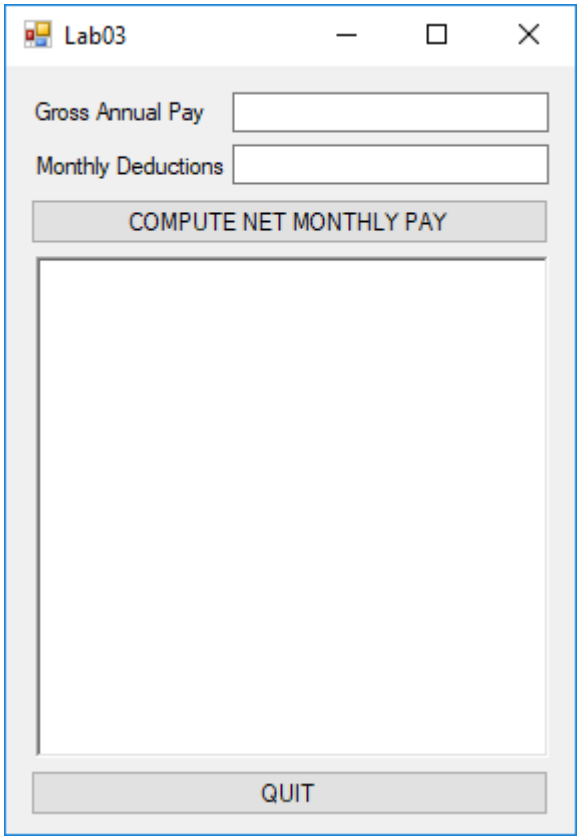
   ```
   Hello Miller, John
   ```

> When done, save and close file `StraightforwardProgram_Part1.rap`.

2. Launch VS Express 2013 to create a Visual Basic program called `StraightforwardProgram_Part2` inside the folder `StraightforwardProgram` inside of your lab folder. For directions creating a Visual Basic program in VS Express 2013, consult the document **VSExpress2013.pdf**.

   Your created project will contain a single empty Form object by default. In the Form properties window (if it is not completely visible, click on the Properties tab on the right side of the screen), change the Name property to **frmStraightforwardProgram** and Text property to **Straightforward Program**. (PS: the Name property of an object CANNOT contain spaces).

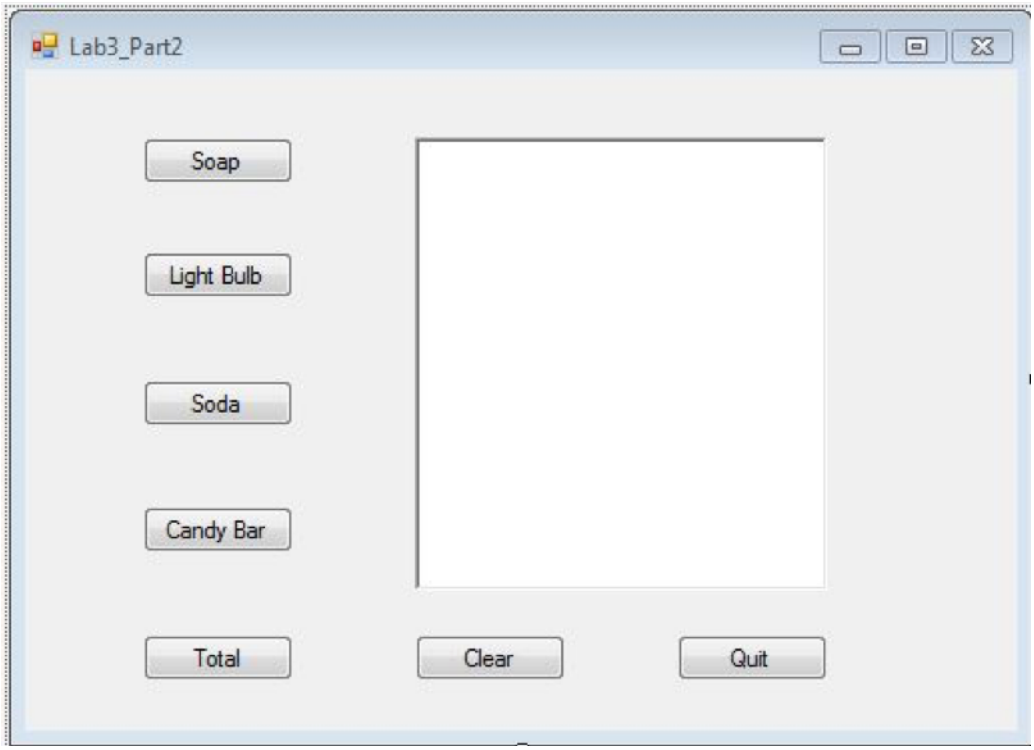
   Complete the program `StraightforwardProgram_Part2` so that is the equivalent of your RAPTOR program, `StraightforwardProgram_Part1.rap`. It should look something like this:



Next, enhance your Visual Basic program to request additional user input. Specifically, the user should input the following along with first and last name:

- month of birth
- day of birth
- year of birth
- college
- major
- something interesting about themselves

Then, using the additional user input, the output sentence should be updated as well. Your program should now behave identically to the following example (given identical input):



When done, save and close project `StraightforwardProgram_Part2`.

Part 1 (30/100): A successful `StraightforwardProgram_Part2` program:

- is based on a complete and correct `StraightforwardProgram_Part1.rap` RAPTOR program that produces correctly formatted output for input first and last name, as in the first example in this exercise
- produces correctly formatted output for sample input described in the second example in this exercise

Video rental store

1. Launch the RAPTOR software and use it to create and save a new program called `VideoRentalStore_Part1.rap` inside the folder `VideoRentalStore` inside of your lab folder.

   Complete `VideoRentalStore_Part1.rap` to prompt the user to input a customer's full name and the number of videos rented out; compute (and store in a new variable) the total cost assuming videos are rented out for a single day at a $2.50 per day; and display in the *MasterConsole* the customer name and total cost in a nicely formatted message as in the example below, assuming the user's full name is `Mary Smith` and 5 videos were rented out:

   ```
   Total cost for Mary Smith is $12.5000
   ```

When done, save and close file `VideoRentalStore_Part1.rap`.

2. Launch VS Express 2013 and create a new Visual Basic project called `VideoRentalStore_Part2` inside the folder `VideoRentalStore` inside of your lab folder.

   Complete program `VideoRentalStore_Part2` so that it is the equivalent of your RAPTOR program, `VideoRentalStore_Part1.rap`.

   Next, enhance the Visual Basic program so that it can handle a variable number of days. For example, for input `Mary Smith` and 5 videos rented out for 3 days, the output becomes:

   ```
   Total cost for Mary Smith is $37.5000
   ```

When done, save and close project `VideoRentalStore_Part2`.

Part 2 (65/100): A successful `VideoRentalStore_Part2` program:

- is based on a complete and correct `VideoRentalStore_Part1.rap` RAPTOR program that produces correctly formatted output for input customer name and number of videos rented out, as shown in the first example in this exercise
- produces correctly formatted output, for input customer name, number of videos rented out and number of days, as shown in the second example in this exercise
- must also have successfully completed Part 1

3. Use **File Explorer** to navigate to the folder containing your final version of your project `VideoRentalStore_Part2` in your lab folder. Copy and paste this project in the same folder, and then right-click on the copy to rename it as `VideoRentalStore_Part3`. Launch VS Express and use it to open the project `VideoRentalStore_Part3`.

   Make the necessary changes to project `VideoRentalStore_Part3` to allow customers to rent out premium videos @ $5.25 per day in addition to regular videos @ $2.50 per day. The input number of days will apply to both types of videos; for example, for 5 regular videos and 3 premium videos rented out for 3 days, your program would display:

   ```
   Total cost for Mary Smith is $84.75
   ```

   Note that (5 * 2.50 + 3 * 5.25) * 3 = 84.75

   Next, have your program display the output in a meaningful format which includes the pretax total and the total after applying a 7% sales tax as in the example below:

   Program input:

   ```
   Enter customer name: XX YY
   Enter number of regular videos (@ $2.50 per day): 5
   Enter number of premium videos (@ $5.25 per day): 3
   Enter number of days: 5
   ```

   Program output:

   ```
   Hello XX YY, your pretax total for 5 regular videos and 3 premium videos for 5 days is $141.25, or
   ```

When done, save and close project `VideoRentalStore_Part3`.

Part 3 (70/100): A successful `VideoRentalStore_Part3` program:

- produces correctly formatted output, including pretax and after-tax total as in the last example above, for input customer name, number of regular videos rented out, number of premium videos rented out and number of days.
- must also have successfully completed Part 1

4. Use your `VideoRentalStore_Part3` program to complete the following test table for the different input values shown on the left. This activity is known as program testing which is common practice in computer programming. The importance of this seemingly tedious activity cannot be overstated! Thoroughly testing computer programs under different input scenarios ensures they behave as expected especially for "special" cases which are often ignored by programmers making programs susceptible to failure.

Input values for your program *(run your program for each of the following cases; provide a customer name of your own choosing)*			**Expected program output for after-tax total** *(what output you expect your program to produce for the given inputs)*	**Actual program output for after-tax total** *(what output your program actually produces for the given inputs)*
Number of regular videos	**Number of premium videos**	**Number of days**	*please compute by hand and write down missing entries (indicated by ???)*	*please write down the after-tax total values produced by your program*
3	2	5	96.3	
1	1	1	8.2925	
0	5	1	???	
1	0	1	???	
0	0	1	???	
1	5	0	???	

Part 4 (75/100): A successful part 4:

- produces correct output: the expected after-tax total MUST match the actual after-tax total for all cases in the table
- must also have successfully completed Part 1

Submission Instructions

During our next lab meeting, you will be asked to expand your solutions to Part 3 and work on new exercise. Prior to the meeting, you are expected to

- finish ALL parts of this lab,
- study (again) any material you struggled with in this lab, and
- study new material needed for the next lab

You will submit your work for this lab and the next one together at the end of our next lab meeting