LAB 6 REQUIREMENTS

Problem:

In this lab you will create a graphing program that will allow a user to graph a parabola by entering the appropriate function parameters and graph the function. We will use the Microsoft Chart control for the graph. The user can also set the x- and y-axis bounds and the number of points used to graph the function.

PART A

First, create the interface in Visual C# .NET. Place a TabControl on your form that has three tabs. One tab should be used for selecting the graph type and providing the parameters of the equation. A second tab is used for selecting the x- and y-axis bounds. The final tab is used for displaying the graph. Figure 1 shows an example of what sample program looks like when running. Recall that a parabola is of the form $y = ax^2 + bx + c$.

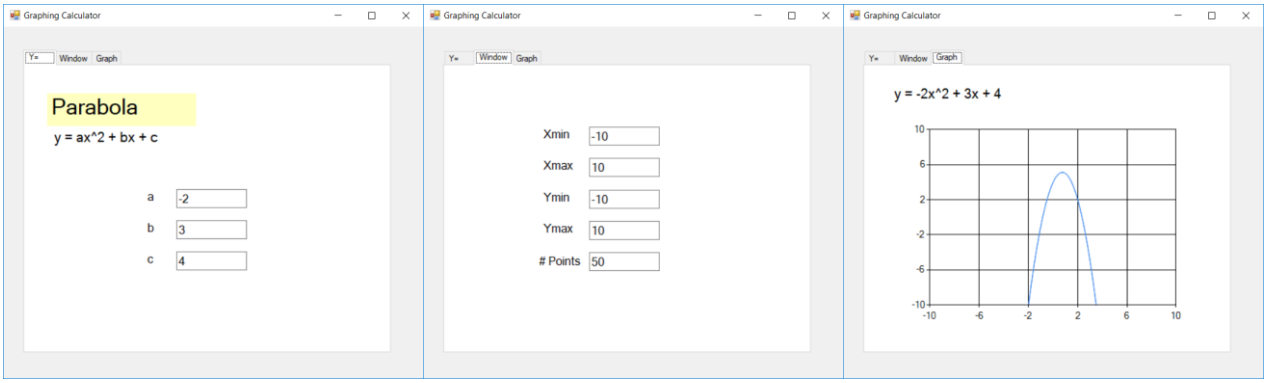

Figure 1 - Sample program images

PART B:

The user is now expected to enter the parameters using the TextBoxes provided. After they enter the parameters for the parabola, they should click the Graph tab to graph the function.

Write the code that will execute when the graph tab is selected. When a tab of a TabControl is selected, it triggers a *SelectedIndexChanged* event. You must use an If or Select Case statement to determine which index was selected and perform the appropriate task based on that information. Remember that the *SelectedIndex* starts at 0.

There are two major tasks that are performed when the graph tab is selected. First, all the labels on this graph need to be updated. These labels are used to display the maximum and minimum axis values, the number of data points graphed, and the equation that is being graphed (the parabola with parameters plugged in, i.e. -2x^2 + 3x + 4). In order to keep your code organized, you should write a method to perform this task.

You should also write a method to fill the data in your graph. When this method is executed, the program will set the axis on the Microsoft Chart Control according to what they have selected and graph the function. To set the minimum and maximum values for the Y-axis, you can access the chart's ChartArea:

```
myChart.ChartAreas[0].Axes[1].Minimum = <Ymin>;
myChart.ChartAreas[0].Axes[1].Maximum = <Ymax>;
```

The Axes[1] refers to the Y-axis, Axes[0] would refer to the X-axis properties.

Don't just copy and paste the code above. Type it in yourself so that you can see the options come up as you type. Notice the options. Make sure to set both axes scales.

Using a FOR loop, you can iterate for each of data points that you will plot (given by the value entered by the user for the number of data points). You will need to use the x-axis range and number of data points to come up with a variable to plug into the function that you are graphing.

Be creative and add your own style to the user interface. Test and debug your program. When everything works, demonstrate your program to your lab mentor. Be sure that you have your lab mentor sign and date your lab to receive credit.

STEPS FOR SUBMITTING YOUR LAB:

For each lab and following comments must be added at the beginning of your Visual C# code.

```
/*‘LAB #
‘SEMESTER NAME
‘STUDENT’S FIRST NAME, LAST NAME
‘I fully understand the following statement.
‘OU PLAGIARISM POLICY
‘All members of the academic community at Oakland are expected to practice and uphold ‘standards of academic integrity and honesty. An instructor is expected to inform and instruct ‘students about the procedures and standards of research and documentation required of students ‘in fulfilling course work. A student is expected to follow such instructions and be sure the rules ‘and procedures are understood in order to avoid inadvertent misrepresentation of her/his work. ‘Students must assume that individual (unaided) work on exams and lab reports and documentation ‘of sources is expected unless the instructor specifically says that is not necessary.

‘The following definitions are some examples of academic dishonesty:

- ‘Plagiarizing from work of others. Plagiarism is using someone else's work or ideas without ‘giving the other person credit; by doing this, a student is, in effect, claiming credit for ‘someone else's thinking. Whether the student has read or heard the information she/he uses, ‘the student must document the source of information. When dealing with written sources, ‘a clear distinction would be made between quotations (which reproduce information from ‘the source word-for-word within quotation marks) and paraphrases (which digest the ‘source information and produce it in the student's own words). Both direct quotations and ‘paraphrases must be documented. Just because a student rephrases, condenses or selects ‘from another person's work, the ideas are still the other person's, and failure to give ‘credit constitutes misrepresentation of the student's actual work and plagiarism of ‘another's ideas. Naturally, buying a paper and handing it in as one's own work is ‘plagiarism.
- ‘Cheating on lab reports falsifying data or submitting data not based on student's own work.

*/
```

All labs will be submitted electronically, no paper copies will be given to Lab mentors.

Before submission:

- Please create a folder named as Lab6_FName_LName:
- **Place your solution file under this folder.**
- **Zip the folder** then upload through Moodle. You will not be able to upload unless you zip, 7zip or rar the folder.

GETTING READY FOR AN INTERVIEW with your Lab Mentor:

The interview is 40% of your lab grade. Make sure to be prepared for your mentor's questions about your program.

When it is your turn to explain your lab to your Lab mentor follow these steps **while your lab mentor is present**:

1. Log on to Moodle.
2. Find your submission link for this lab.
3. Download your Lab on your computer
4. Find your lab wherever you downloaded it to.
5. Make sure to Unzip, (or extract) your folder
6. Open the solution file to demo your lab.

You must follow these steps each time you are being graded for your lab. Your lab mentor must confirm that you downloaded what was submitted on Moodle. You should be graded on what was uploaded on Moodle, not on a local copy obtained from your C drive or external drives (i.e. memory sticks).

HOW WILL YOU BE GRADED BY YOUR LAB MENTOR AND WHAT IS THE GRADING CRITERIA?

1. The application works and was fully tested from what was downloaded and demonstrated from the copy uploaded to Moodle and not from a local copy or any external drive. (50 points)
2. Proper naming conventions were followed as explained in class (10 points)
3. Grade assigned based on oral examination of the students understanding of their solution and the overall quality of the solution (40 points)

GRADE: _____ out of 100