

FACULTY OF COMPUTERS, INFORMATICS AND MICROELECTRONICS

TECHNICAL UNIVERSITY OF MOLDOVA

WINDOWS PROGRAMMING

LABORATORY WORK #3

Basics of Working with Mouse. GDI Primitives. Bezier Curve.

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Laboratory work #3

1 Purpose of the laboratory

Gain knowledge about basics of event-driven programming, understanding of window's class and basic possibilities of Win32 API. Also she will try to understand and process OS messages.

2 Laboratory Work Requirements

- **Basic Level (grade 5 - 6) you should be able to:**
 - a) Draw 5 lines of different colors and weights
 - b) Draw 2 Bezier curves
 - c) Draw 4 plane objects
 - d) Draw 2 different objects using mouse
- **Normal Level (grade 7 - 8) you should be able to:**
 - a) Realize the tasks from *Basic Level*.
 - b) Draw a custom bitmap image
 - c) Fill 2 object with gradient
 - d) Draw a Bezier curve using mouse
- **Advanced Level (grade 9 - 10) you should be able to:**
 - a) Realize the tasks from *Normal Level*.
 - b) Zoom in and out application working area using keyboard
 - c) Use mouse as an eraser (choose 1 option):
 - 1) delete objects using mouse clicking
 - 2) eraser of a fixed width
 - 3) eraser with adjustable width
- **Bonus Point Task:**
 - a) Realize the task with mouse eraser for all 3 cases listed above. In order to choose one of them, add 3 buttons/icons or check boxes.

3 Laboratory work implementation

3.1 Tasks and Points

I chose to implement the tasks for *Normal Level*:

- a) Draw 5 lines of different colors and weights
- b) Draw 2 Bezier curves
- c) Draw 4 plane objects
- d) Draw 2 different objects using mouse
- e) Draw a custom bitmap image
- f) Fill 2 object with gradient
- g) Draw a Bezier curve using mouse

3.2 Laboratory work analysis

Here is the link to my repository: https://github.com/thirteenmd/WP_LABS

Like in the previous laboratory work, I chose to work in Visual Studio, I created a new Windows Form Application, added a two picture boxes and some buttons. When the button "Draw 5 lines" is clicked, 5 lines with different weight appear in the first picture box. The names of the following buttons suggest the actions that are to be done if the buttons are clicked. Also if you click the right button on the mouse the picture box becomes blank again.

3.3 Prove your work with screens

Figure 3.1 – Initial window

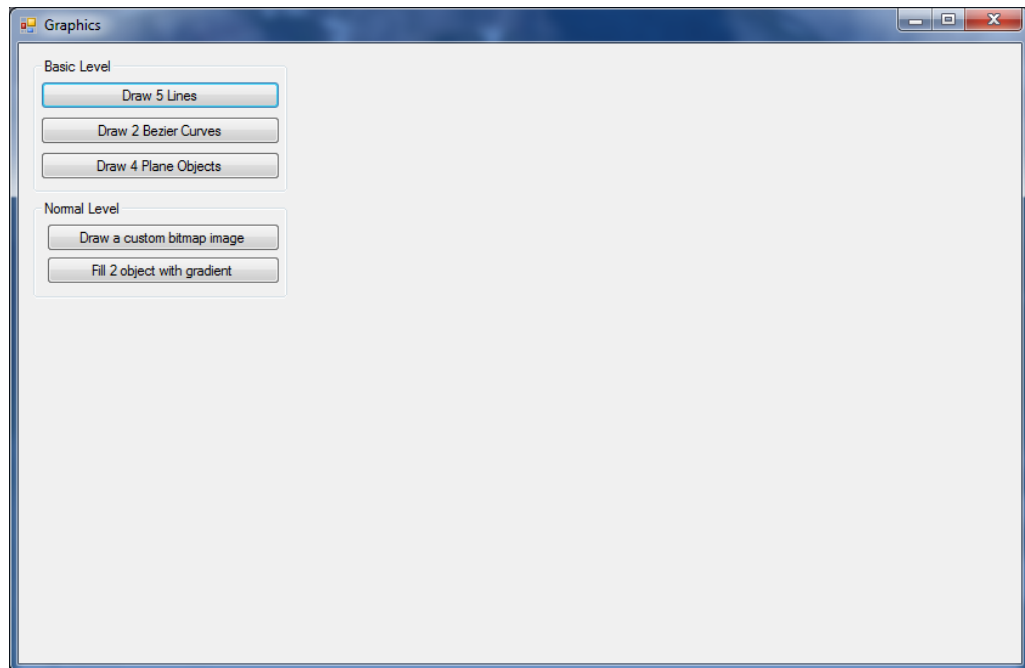


Figure 3.2 – The window after I clicked the right button on the mouse

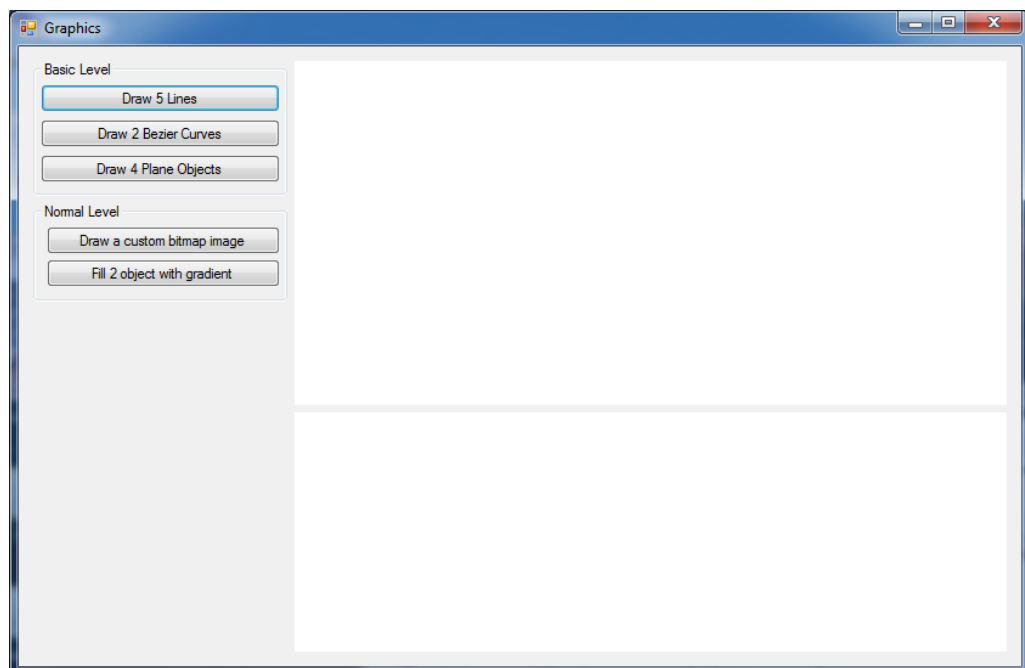


Figure 3.3– Task 1

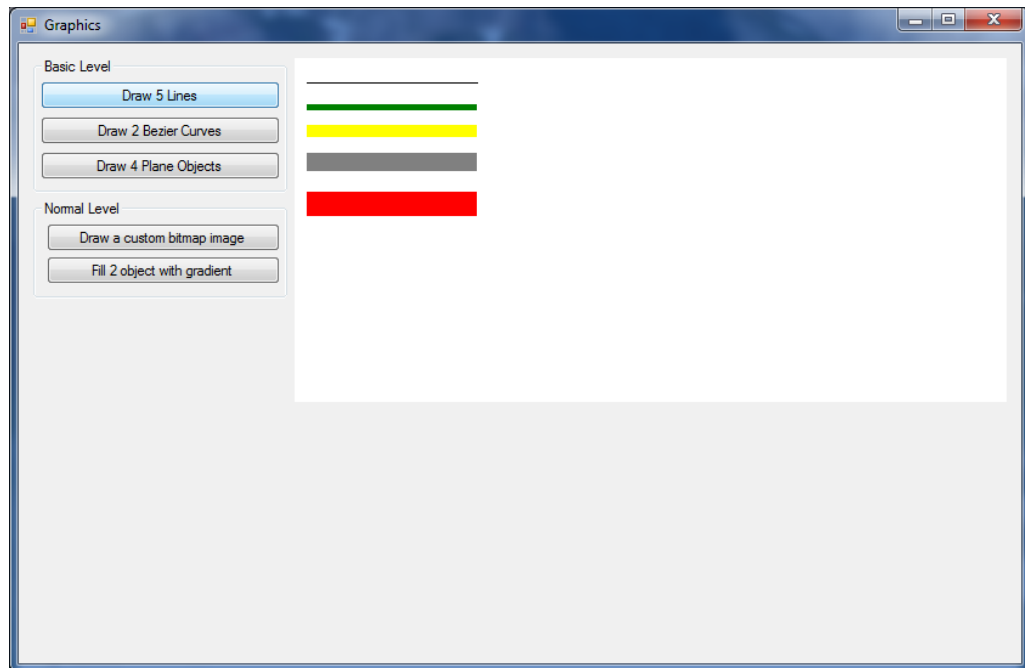


Figure 3.4– Task 2

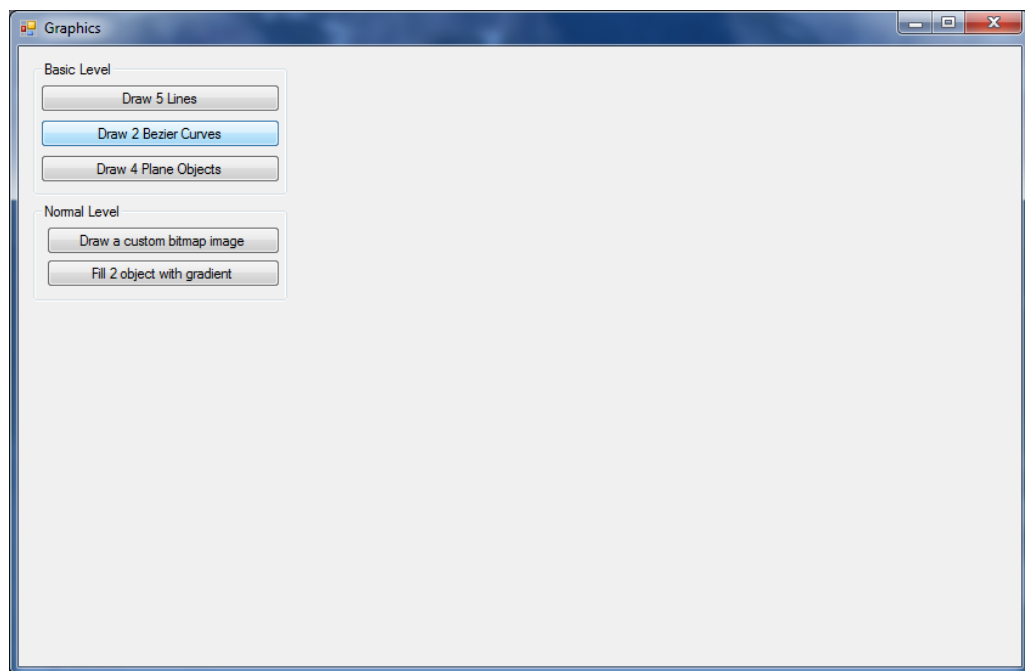


Figure 3.5 – Task 3

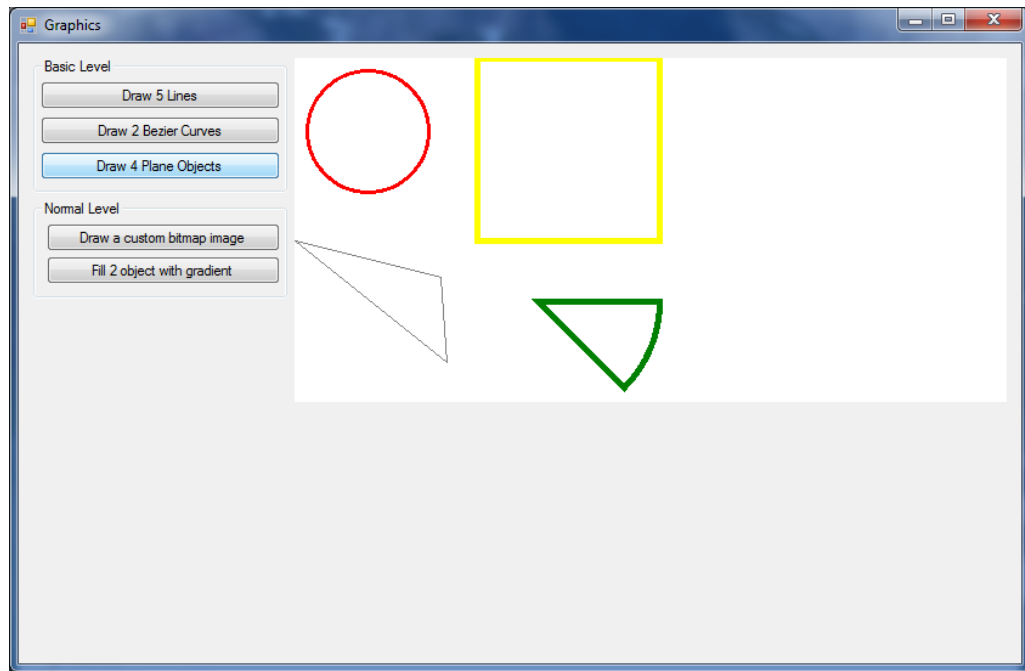


Figure 3.6 – Task 4

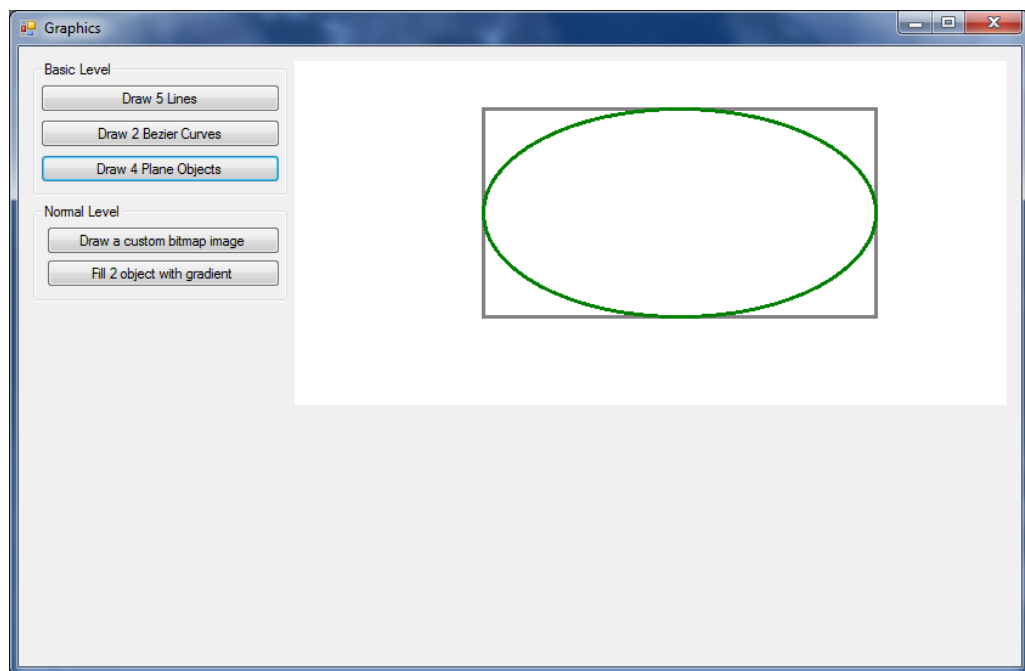


Figure 3.7– Task 5

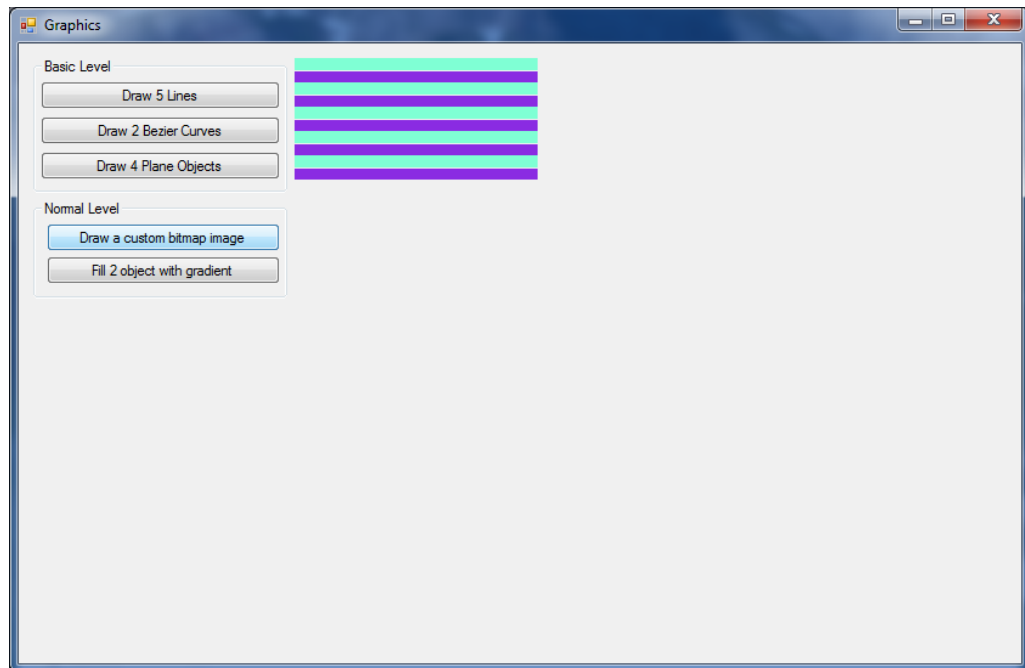


Figure 3.8– Task 6

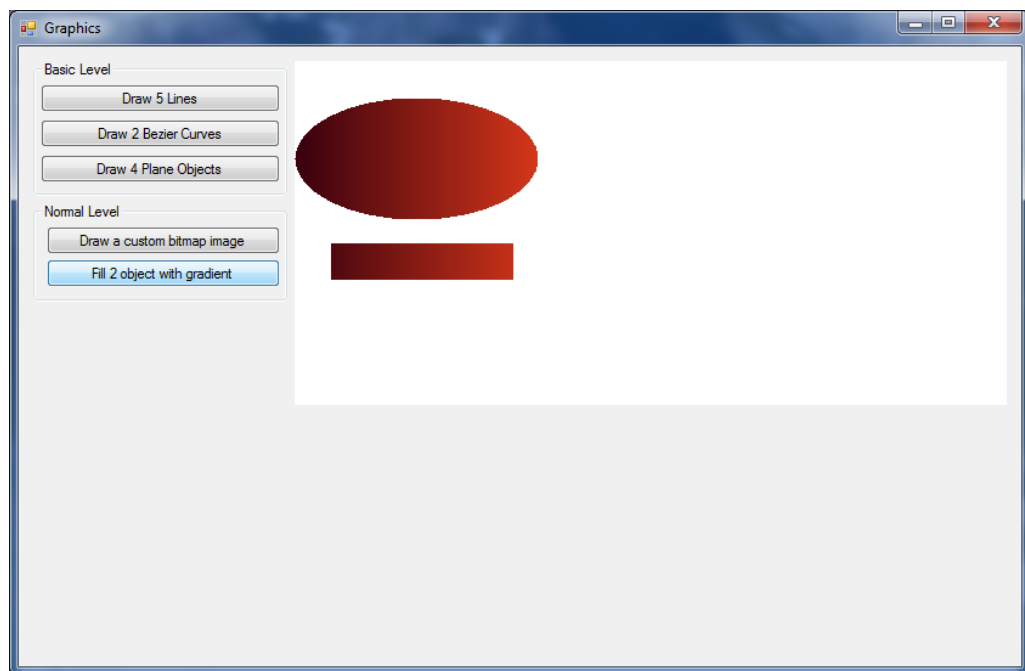
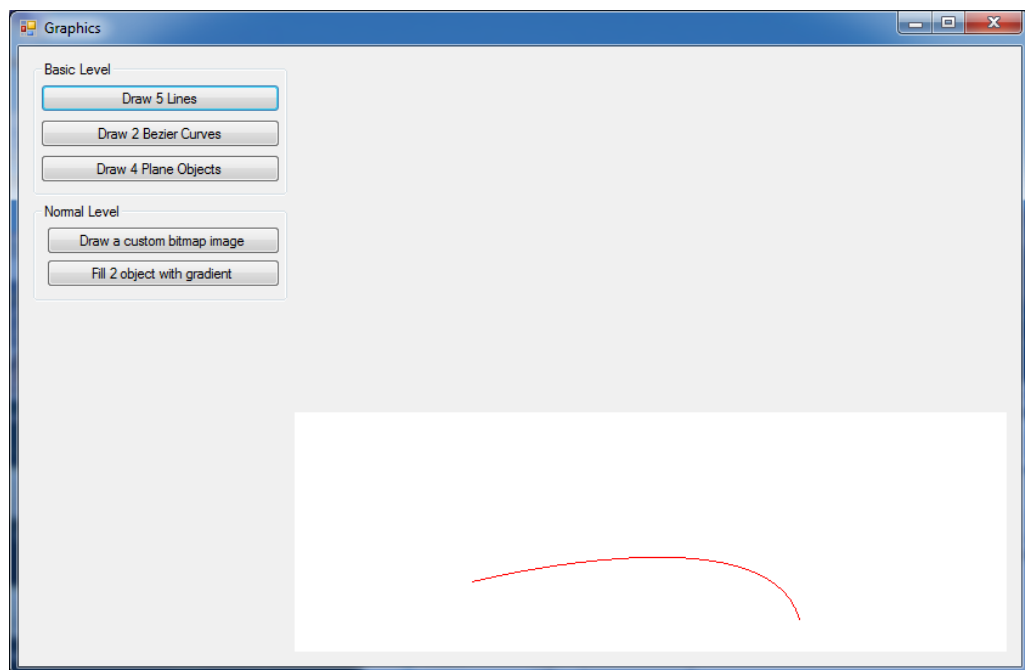


Figure 3.9– Task 7



Conclusions

One of the main purposes of this laboratory work was to familiarize in working with Window Forms. As IDE I chose Microsoft's Visual Studio, because I worked in this environment before. I created a new Windows Form Application, added all the necessary elements and then made the elements interact with each other and changed the behavior of three windows actions.

In this laboratory work I familiarized with the graphics part of a windows application, I learned how to draw lines, bezier curves, objects, how to fill an object with a gradient, how to draw bezier curve with the mouse, and how to draw custom bitmaps.

References

- 1 Random Colors,<http://stackoverflow.com/questions/8465675/creating-random-colors-system-drawing-color>
- 2 Control.KeyPress Event,[https://msdn.microsoft.com/en-us/library/system.windows.forms.control.keypress\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/system.windows.forms.control.keypress(v=vs.110).aspx)
- 3 Control.KeyPress Event,[https://msdn.microsoft.com/en-us/library/system.windows.forms.control.keydown\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/system.windows.forms.control.keydown(v=vs.110).aspx)