

FACULTY OF COMPUTERS, INFORMATICS AND MICROELECTRONICS

TECHNICAL UNIVERSITY OF MOLDOVA

## WINDOWS PROGRAMMING

LABORATORY WORK #1

---

### Window. Basic window's form elements

---

*Authors:*

Andreea - Cristina COJOCARU

*Supervisor:*

Irina COJANU

## Laboratory work #1

### 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) Create a Windows application
  - b) In the middle of the window should be present the following text: "Done with Pride and Prejudice by student name". Replace student name with your name.
  - c) On windows resize, text should reflow and be in window's middle (vertically and horizontally)
- **Normal Level (grade 7 - 8) you should be able to:**
  - a) Realize the tasks from *Basic Level*.
  - b) Add 2 buttons to window: one with default styles, one with custom styles (size, background, text color, font family/size)
  - c) Add 2 text elements to window: one with default styles, one with custom styles (size, background, text color, font family/size)
- **Advanced Level (grade 9 - 10) you should be able to:**
  - a) Realize the tasks from *Normal Level*.
  - b) Make elements to interact or change other elements (2 different interactions) (ex. on button click, change text element color or position)
  - c) Change behavior of different window actions (at least 3). For ex.: on clicking close button, move window to a random location on display working space

### 3 Laboratory work implementation

#### 3.1 Tasks and Points

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

- a) Add 2 buttons to window: one with default styles, one with custom styles (size, background, text color, font family/size)
- b) Add 2 text elements to window: one with default styles, one with custom styles (size, background, text color, font family/size)
- c) Make elements to interact or change other elements (2 different interactions) (ex. on button click, change text element color or position)
- d) Change behavior of different window actions (at least 3). For ex.: on clicking close button, move window to a random location on display working space

#### 3.2 Laboratory work analysis

Here is the link to my repository: [https://github.com/thirteenmd/WP\\_LABS](https://github.com/thirteenmd/WP_LABS)

I chose to work in Visual Studio, I created a new Windows Form Application, and added 2 Labels, 2 TextBoxes and 2 Buttons. I customized half of the elements in the following manner:

- a) For the Label element:
  - 1) changed size to 12 points
  - 2) changed color to DodgerBlue
- b) For the textBox element:
  - 1) changed size to 10 points
  - 2) changed ForeColor to Red
  - 3) changed BackColor to ScrollBar
- c) For the Button element:
  - 1) changed ForeColor to InactiveBorder
  - 2) changed BackColor to HotTrack

To make this Windows Application responsive to resizing I set the minimum size of the window to be 300x350 pixels by handling the event Load, then in the event ResizeEnd I checked what is the new width, if it is less or equal that 560 pixels (the width when the longest element, textBox, is not fully visible) then the position of all custom elements is changed to the left, if the width of the window is more than 560 then all elements go back to their initial places.

To make the elements interact with other elements I handled the event Click of the Button elements. Therefore when a button is clicked a message box appears, the window's text and background color changes and the text inside the text box is changed. The changes are different to each button.

I also changed the behavior of total three window actions: when the window is clicked on the background color changes to a random color, we can close the window by pressing the button 'x' and we can change the position of our form using the arrow keys.

### 3.3 Prove your work with screens

Figure 3.1 – Initial window

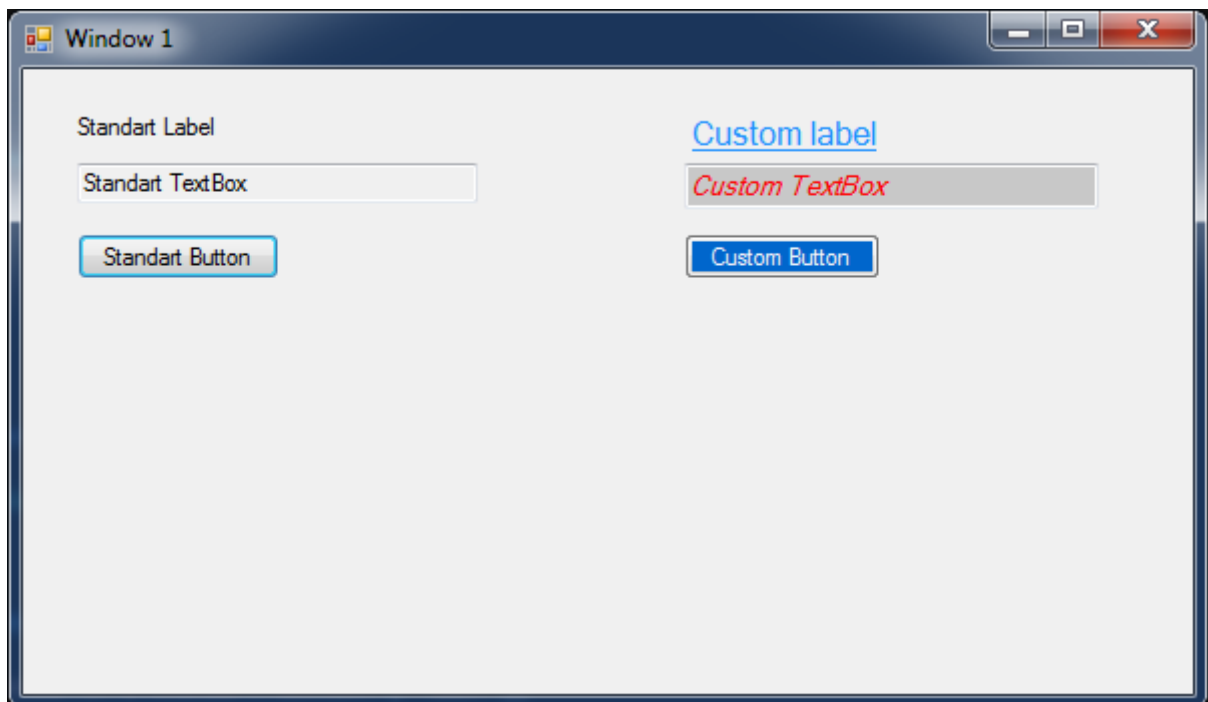


Figure 3.2– The window after I clicked on it once

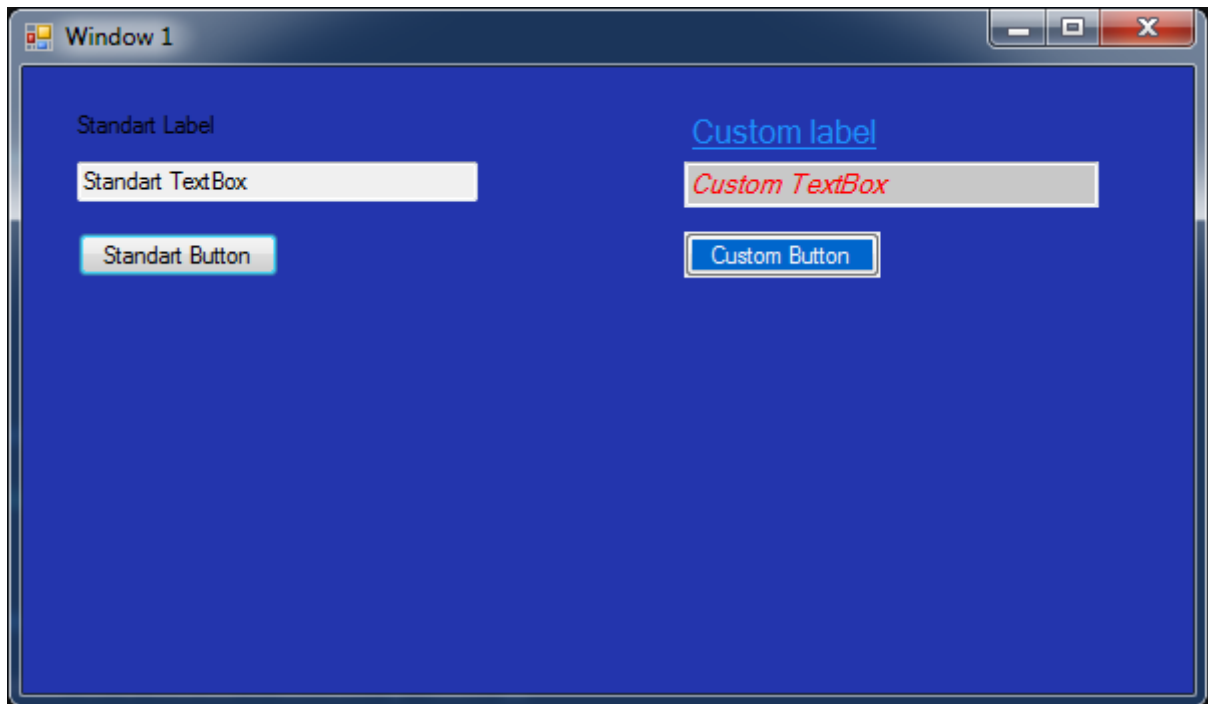


Figure 3.3– The window after I clicked on it the second time

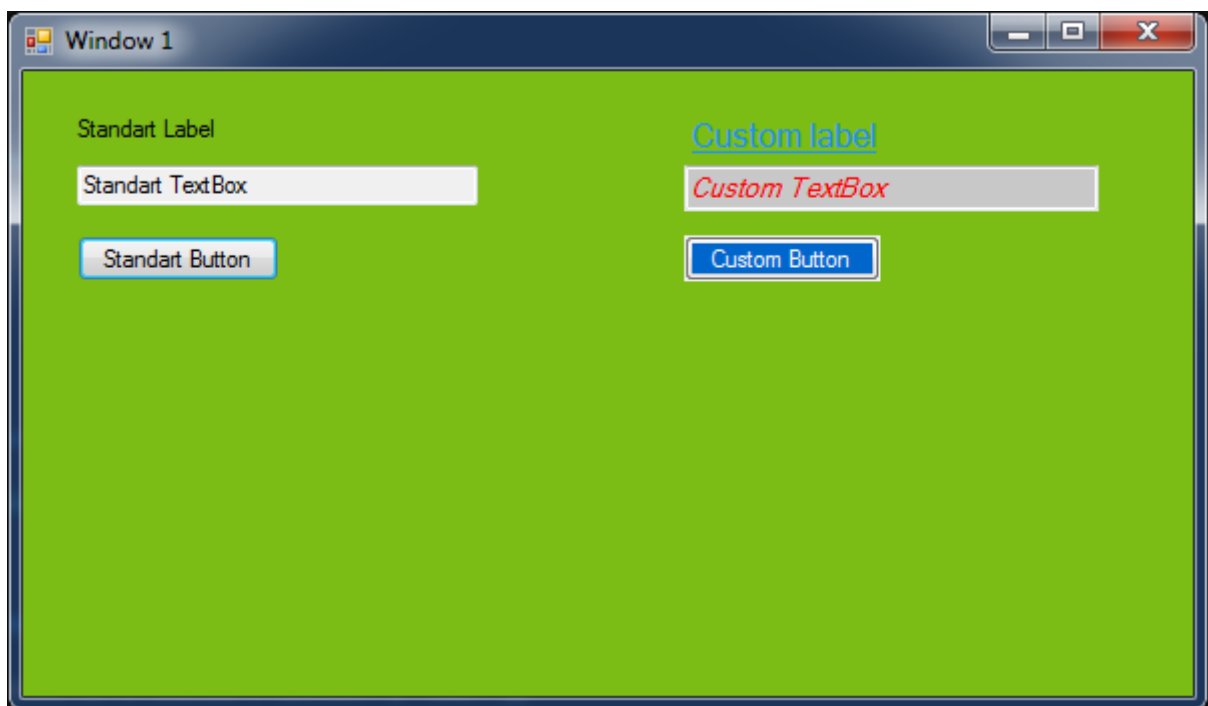


Figure 3.4– The window after I made it smaller

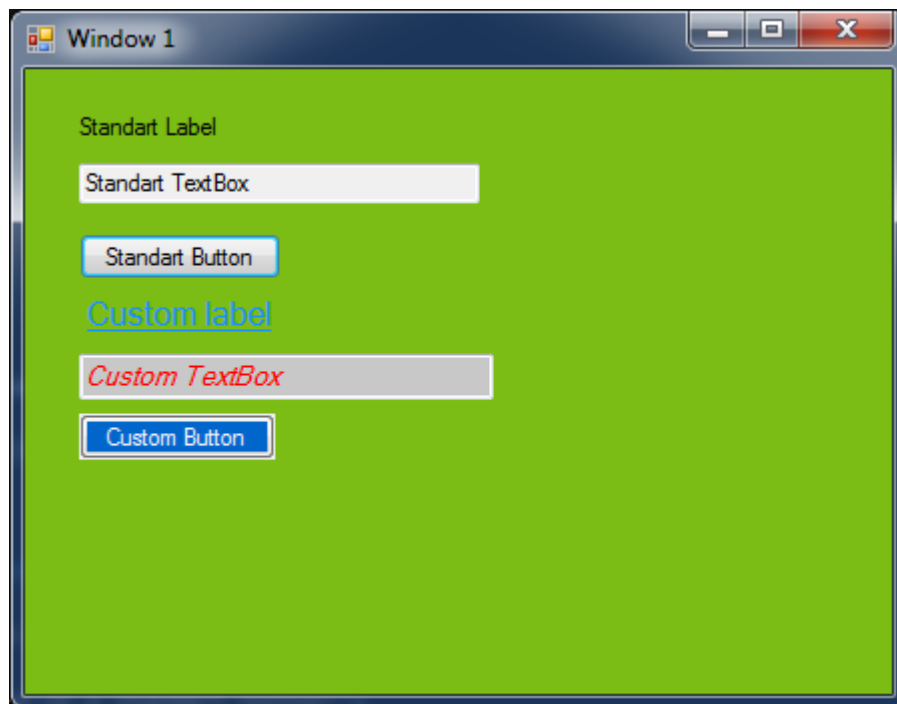


Figure 3.5– The window after I made it larger

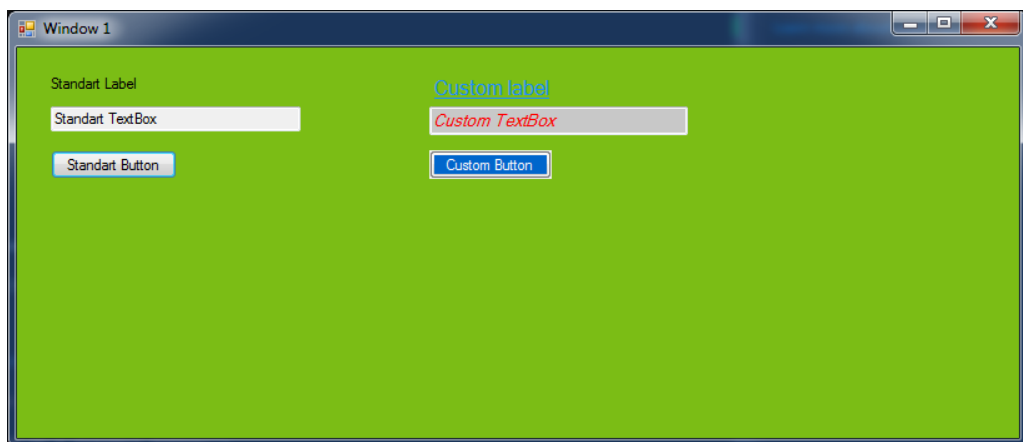


Figure 3.6– The Message Box of the Standart Button

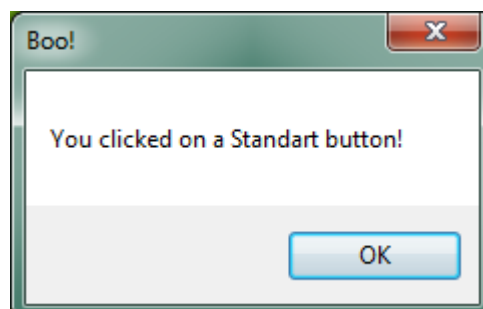


Figure 3.7 – The window the Standart Button is clicked

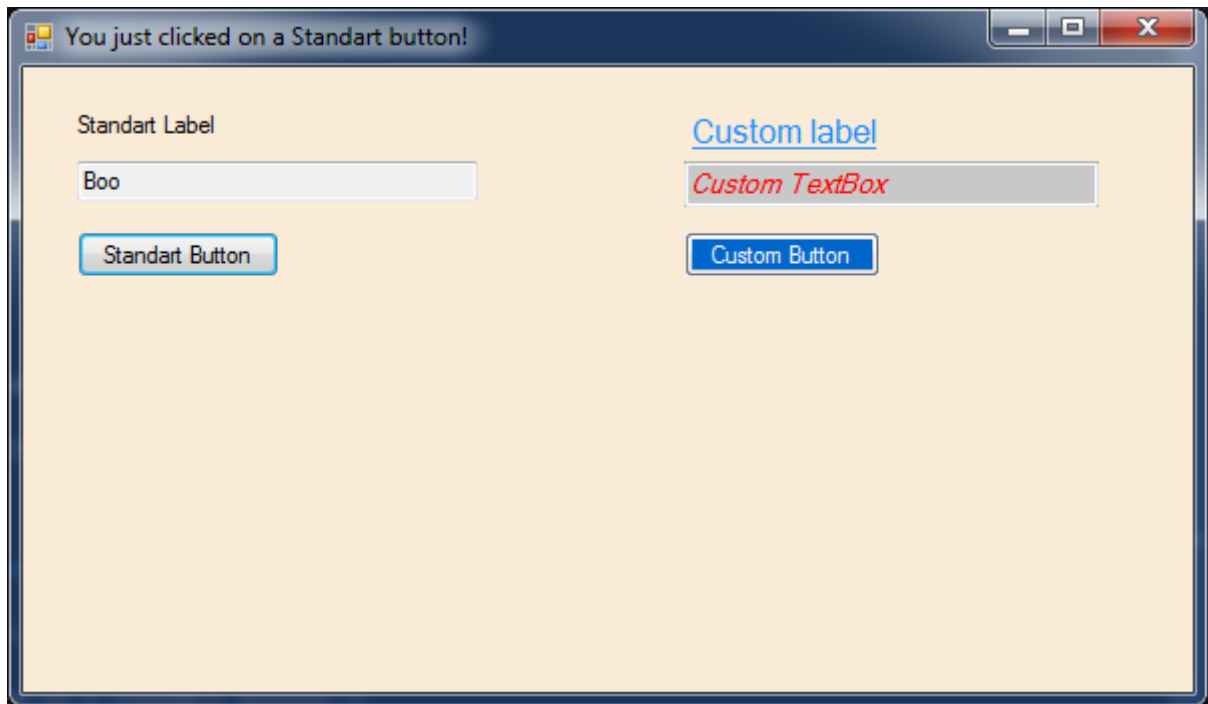


Figure 3.8 – The Message Box of the Custom Button

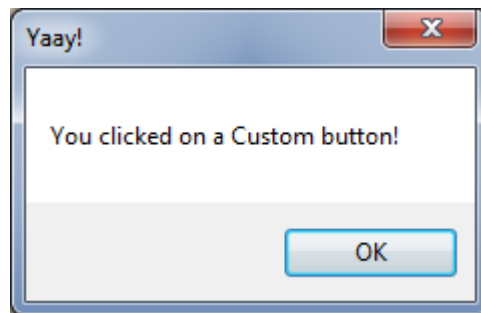
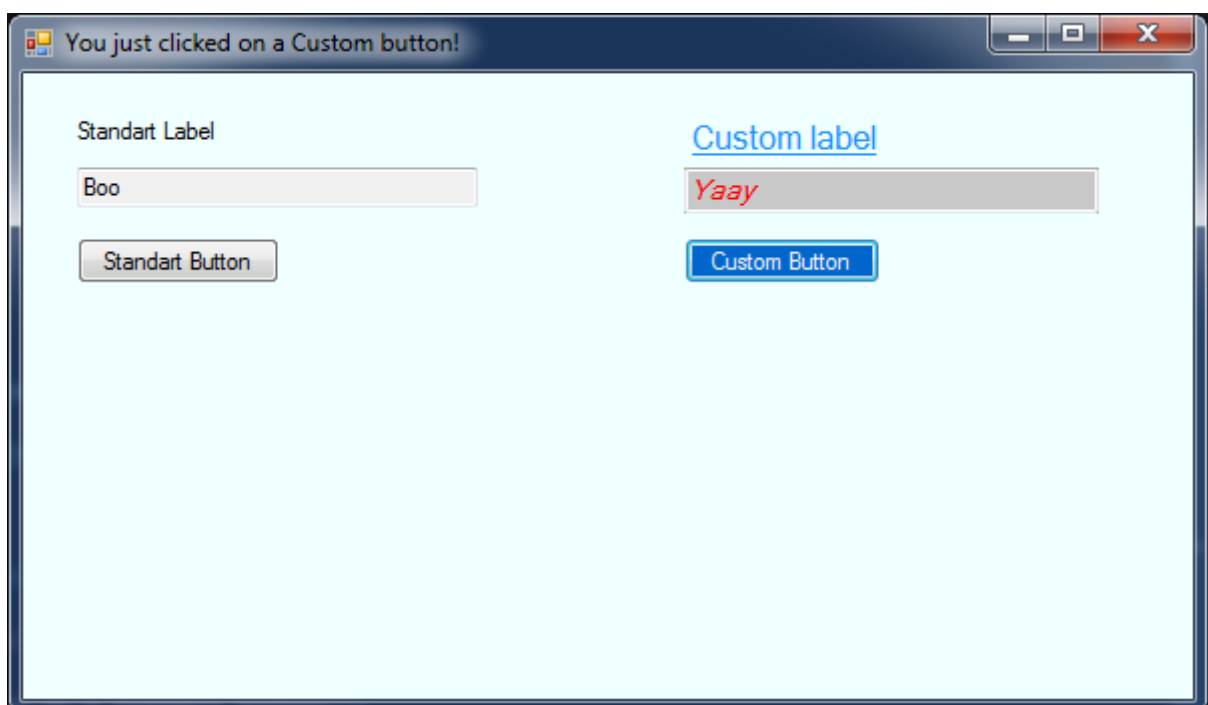


Figure 3.9 – The window the Custom Button is clicked



## 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 revised how to handle the Events of multiple elements such as: Click, Load, ResizeEnd, KeyPress and KeyDown. I also inspected the possible KeyChar values of the KeyPressEventArgs elements, the possible KeyCode values of the KeyEventArgs elements, and when it is preferable to use the KeyDown Event over KeyPress. Then I discovered that in order to be able to control the Window with the keys the property KeyPreview of the form should have the value true.

By doing this laboratory work I consolidated my knowledge in working in this environment, I worked with GIT, I understood the purpose of the ".gitignore" file and made one myself. I also understood how to write and how to structure a "README.md".

Concerning the coding part of the laboratory work, all the code is written in C# and I followed the C++ Programming Style Guidelines, because that style matches my own.



## 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)