Faculty of Computers, Informatics and Microelectronics

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WINDOWS PROGRAMMING

Laboratory work #2

Advanced Form Elements. Child Windows. Basics of Working With Keyboard.

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1 Purpose of the laboratory

Gain knowledge about basics of event-driven programming, understanding of window's class and basic possibilities of Win32 API. Work with child windows and study the basic working of the keyboard.

2 Laboratory Work Requirements

– **Basic Level (grade 5 - 6) you should be able to:**

a) Create a Windows application what will dispaly a dialog box on some event (ex. on clicking some button)

b) Add a system menu to your application with at least 3 items (add actions to that items)

c) Hook keyboard input. Add 2 custom events for 2 different keyboard combinations (ex. change window background on ctrl+space)

– **Normal Level (grade 7 - 8) you should be able to:**

a) Realize the tasks from *Basic Level*.

b) Add a scroll bar that will change any visible parameter of any other element (color of a text) OR other 2 scroll bars that will manage main window size or position

– **Advanced Level (grade 9 - 10) you should be able to:**

a) Realize the tasks from *Normal Level*.

b) Customize your application by adding an icon and using different cursor in application

c) Add a listbox and attach some events when any element is accessed (clicked)

3 Laboratory work implementation

3.1 Tasks and Points

-Create a Windows application what will dispaly a dialog box on some event (ex. on clicking some button)
To create a popup dialog box, before we create one in the source file(rc.file).The AboutDIgProc() was created - the function that will do the displaying of the dialog box.It appears when I press the More option from the menu.

-Add a system menu to your application with at least 3 items (add actions to that items)
The menu was also created in the source file.Popup defines a menu item,Menuitem defines a submenu item.Three items were created: File, More and About, each with different submenu items.

-Hook keyboard input. Add 2 custom events for 2 different keyboard combinations (ex. change window background on ctrl+space)
Hooks : CTRL + W for exiting from the application, and CTRL + I for displaying a dialog box. These actions are managed in the WMHOTKEY case.

-Add a scroll bar that will change any visible parameter of any other element (color of a text) OR other 2 scroll bars that will manage main window size or position
I've created a scrollbar using CreateWindowEx() by specifying the 2nd parameter as "SCROLLBAR" and a xPos variable that is changing the way messages in the WMHSCROLL are called. Color of the text is changing by using the SetTextColor() function together with xPos variable.

-Customize your application by adding an icon and using different cursor in application
I added in the main folder where the main.cpp is located a custom cursos and icon, you can see the cool icon of a magic hat.Then they are declared in source file respectively.

-Add a listbox and attach some events when any element is accessed (clicked)
I've created the listbox using CreateWindowEx() by specifying the 2nd parameter as "LISTBOX". Elements in the listbox are added from the interaction between an editbox and a button. When an element from listbox is double-clicked, a messagebox with the name of selected element is displayed; when on a selected element from listbox is pressed right click, an alert is displayed about deleting the selected element. (this is done in the WMCONTEXTMENU case.)

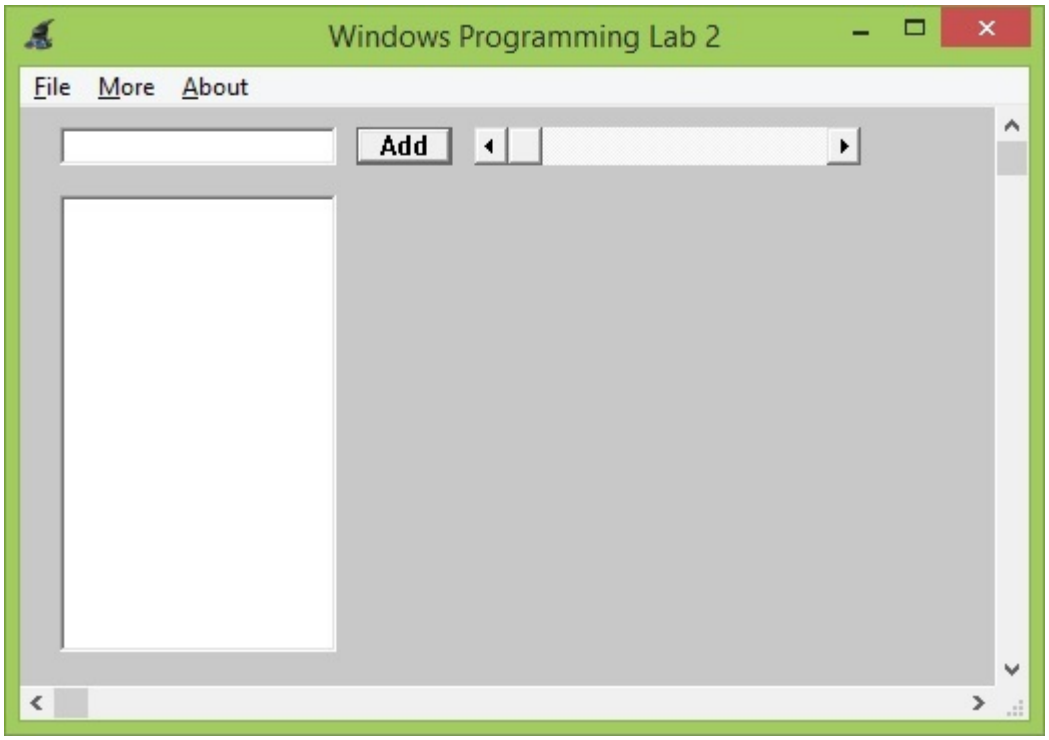
3.2 Laboratory work analysis

Add link to your repository. Create a README.md file for each laboratory work you submit.
`https://github.com/ValeriaBega/PW`

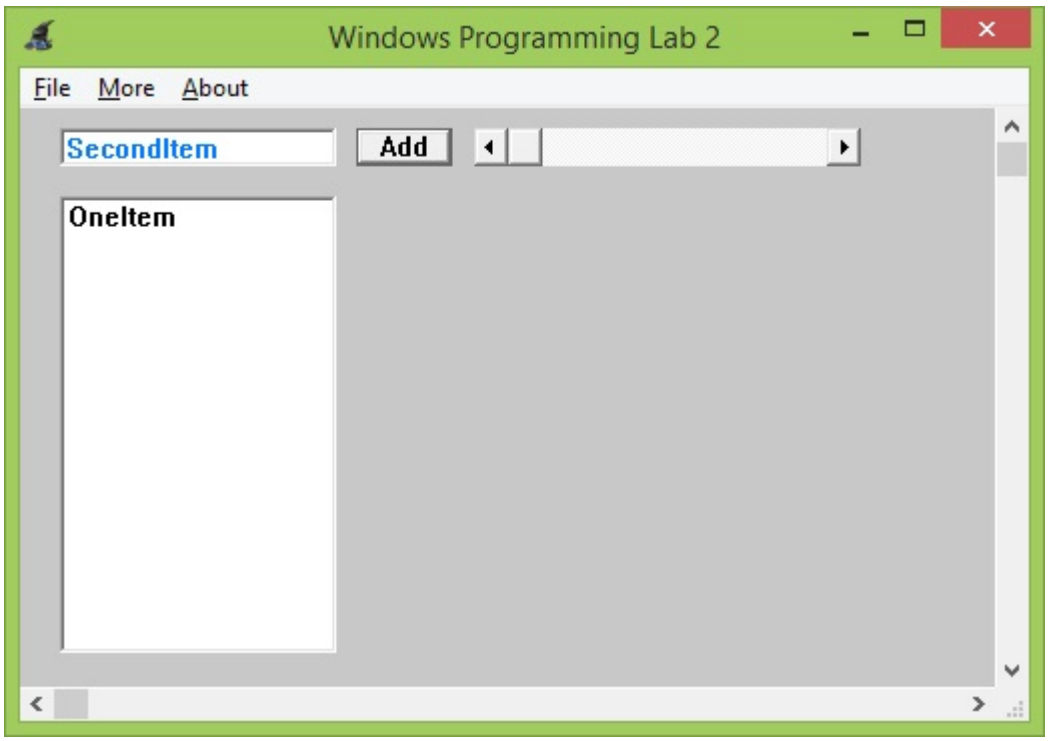
I already explained what my laboratory works containt in the paragraph above.It some new kind of window than we had in the first laboratory work, because it has new features.It has three new items aka menu's with submenu's.Each contains some kind of action(eg: changing the background color).Now we can add and delete different items we introduce and also operate with the window using keyboard shortcuts.There is also a scrollbar which has a special function - it changes the color of the text we introduce, as long as we scroll it.

3.3 Prove your work with screens

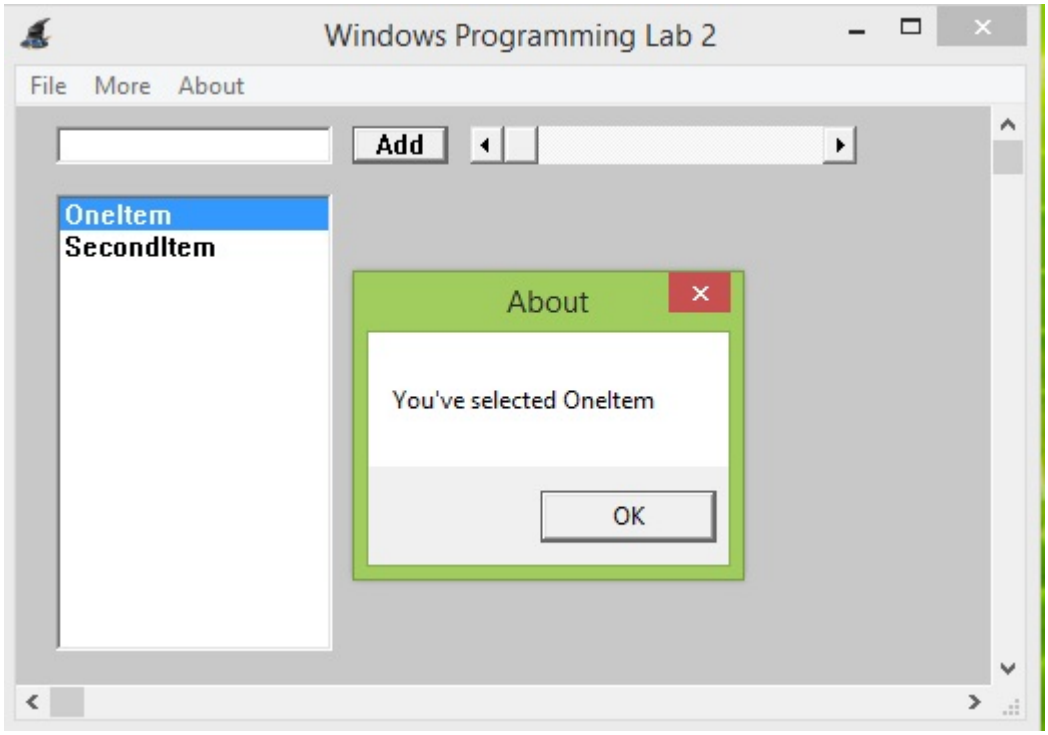
The basic window as we have it:



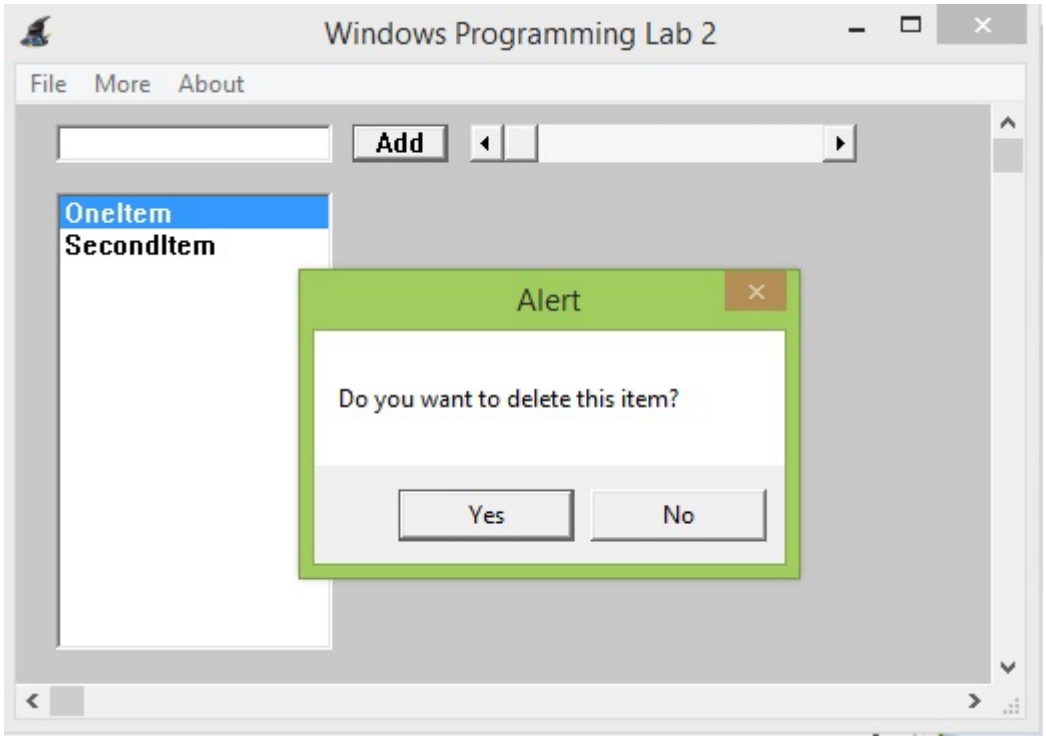
Inserting the text and submitting it:



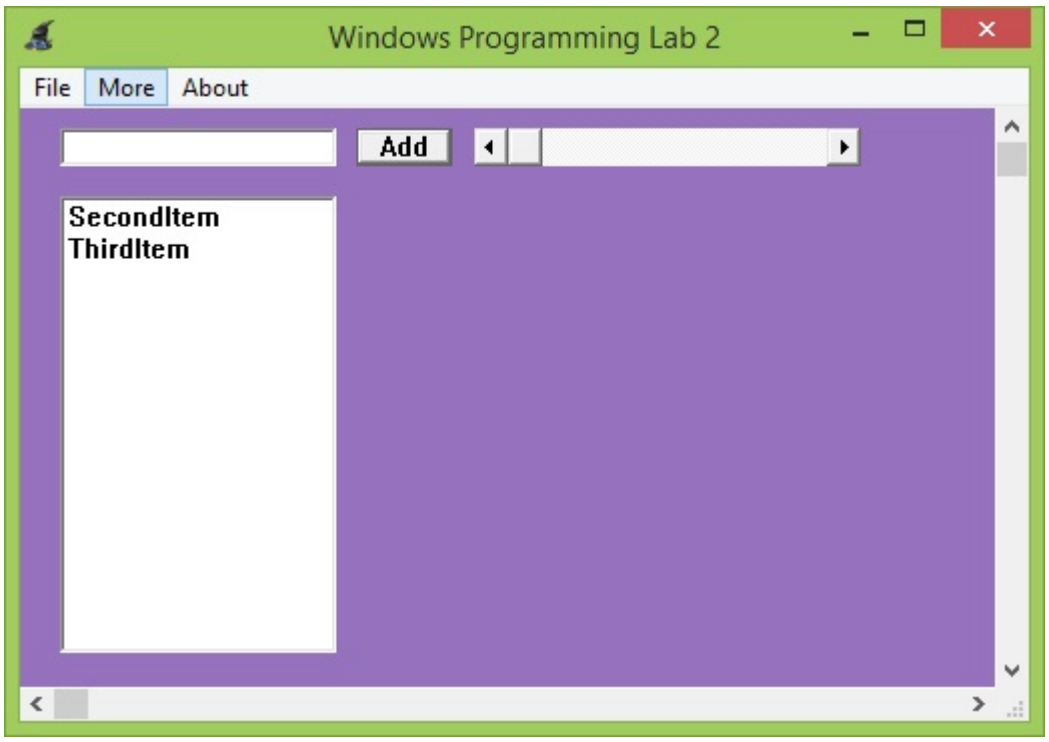
Submitting the second element and showing other options:



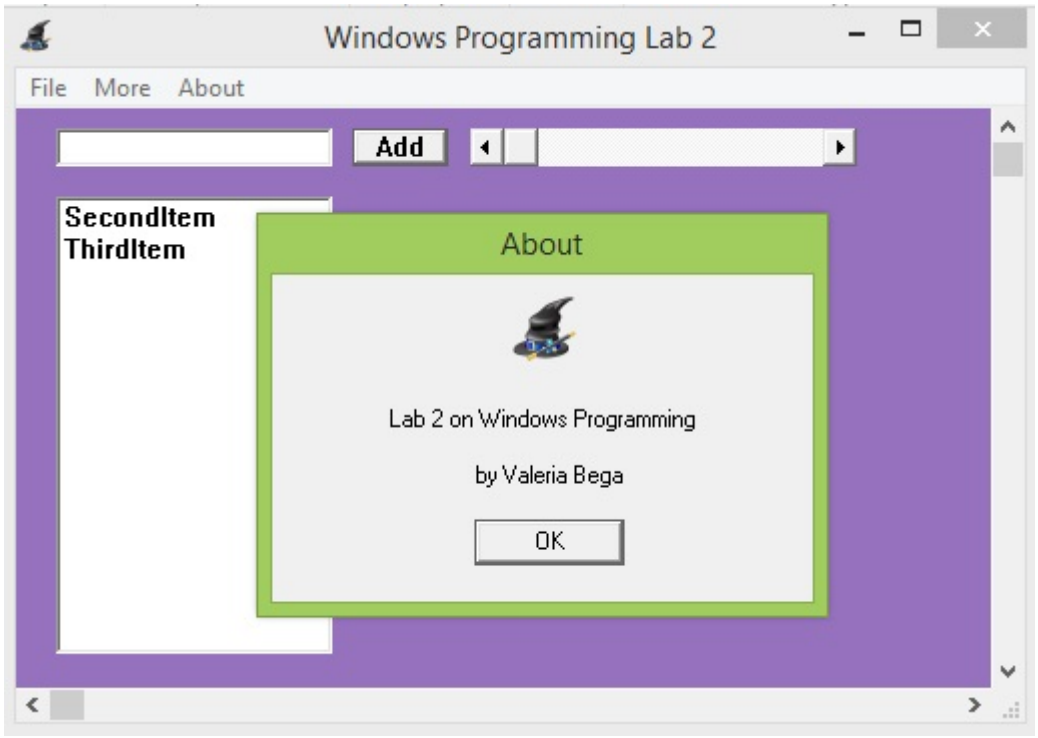
Deleting the chosen item:



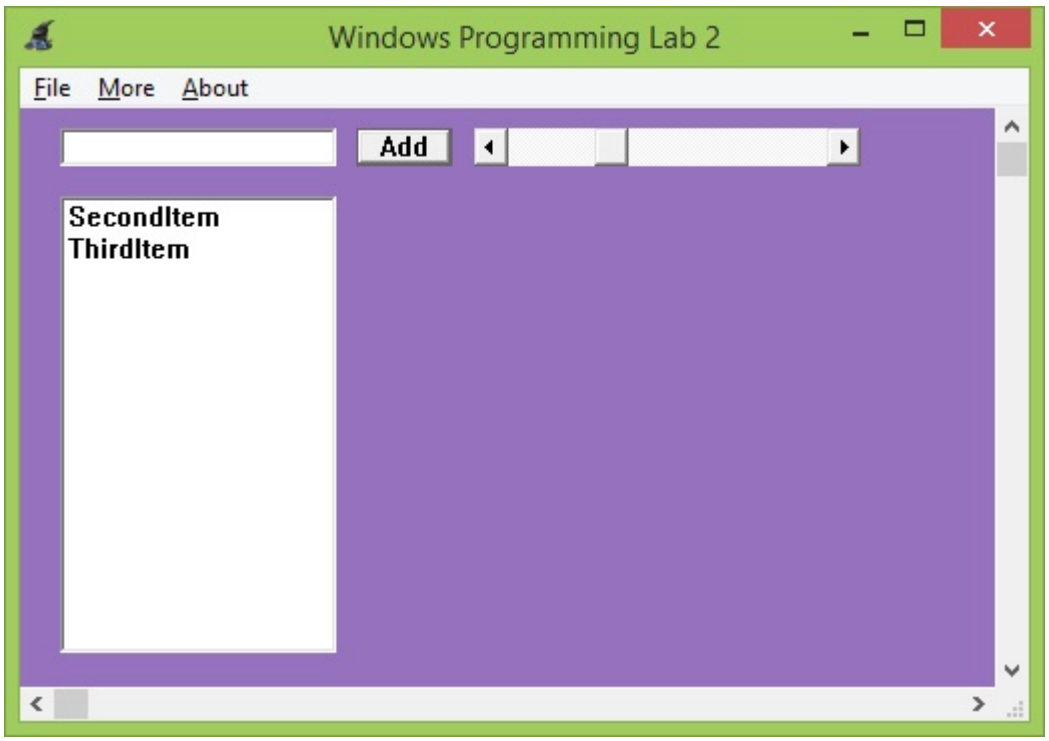
In the more menu changing the background color:



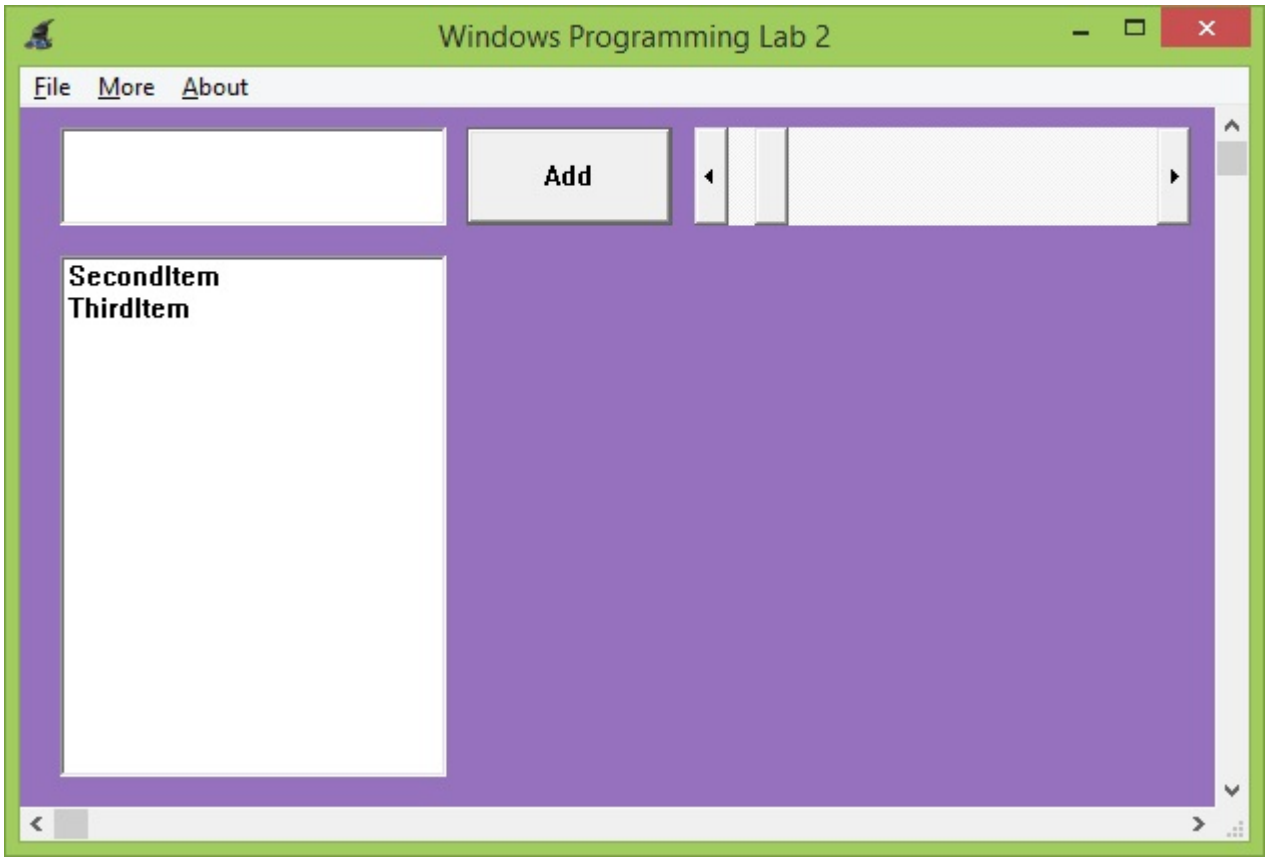
In the about section showing the info on the work:



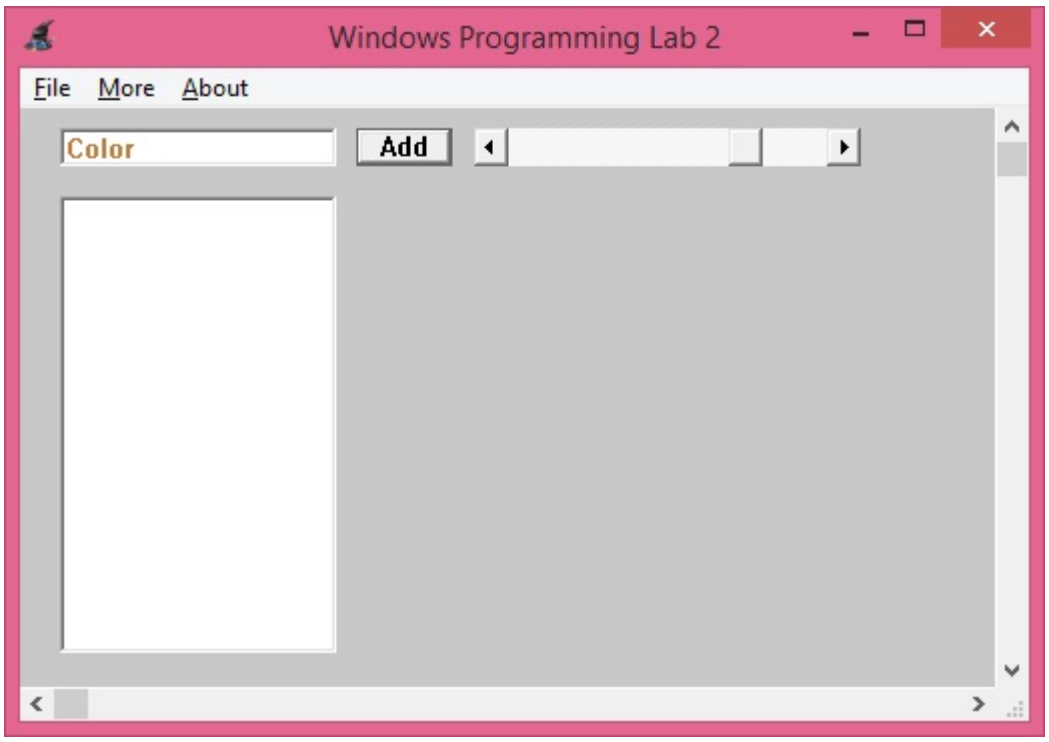
The scrollbar:



Resize of the window:



How the scrollbar changes the color of the introduced text:


Windows Programming Lab 2
File
More
About
Color
Add

Conclusions

While developing this laboratory work I encountered some interesting things.

The first problem I had to work on was handling the scrollbars and trackbars. It turned out to be a bit complicated because the window procedure receives for both controls the same messages (WMHSCROLL and WMVSCROLL), so I had to find out wich control sent the message.

First of all I had to differentiated the standard window scrollbars from control versions by checking the lParam that came with the message: if it was null then the message was sent by a standard scrollbar, else, it was generated by a control and it stored the HWND of the sender. After that I had to separate the messages from trackbar control and the scrollbar control by retrieving the control Identifier from its HWND (GetDlgCtrlID((HWND)lParam);) and finaly handle control-specific messages for each (scroll/track)bar.

Overall the making of the laboratory work was though but quite informative as I 've learned more about advanced child windows control, scrollbars,keyboards.

References

1 Microsoft Windows, *official page*, https://msdn.microsoft.com/en-us/library/bb384843.aspx

2 C++ website, http://www.cprogramming.com/tutorial/opengl_first_windows_app.html

3 LateX basics, https://www.sharelatex.com