Faculty of Computers, Informatics and Microelectronics

Technical University of Moldova

WINDOWS PROGRAMMING

Laboratory work #1

Window. Window handling. Basic windows form elements

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1 Purpose of the laboratory

Gain knowledge about basics of event-driven programming, understanding of windows 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

- Basic Level, all tasks
- Normal Level, all tasks
- Advanced Level, all tasks

3.2 Laboratory work analysis

In order to get this GUI application to work, I didnt use something special. Development of this application was based on Programming Windows by Charlez Petzold, using standard libraries and Visual Studio as IDE.

Our basic task was present in the middle of the screen the given phrase, and this was achieved by using standard function for drawing text "DrawText()", with specific parameters for aligning our text in the middle of screen. Also at window resize our text must remain in the same position, and this is why, the code which implements this behavior is placed at case"WM_PAINT in switch menu which handle events. Case "WM_PAINT is handled every time when window becomes invalid.

Normal Level Task required 2 buttons and 2 text elements, which have custom and default styles. Defaults styled buttons are declared trivial, but custom buttons should be declared in specific mode. For custom button is declared specific style "BS_OWNERDRAW" and in order to get button with custom background color we need to use function "FillRect(), which uses a custom made brush for painting background of button. In order to get custom text elements it is necessary only to create a custom font, using function "CreateFont() which in some way is trivial.

Advanced Level Task is based on handle events of specific elements, like added buttons and also window button. In order to handle the events of added buttons is used "WM_COMMAND case of switch, which is handle every time when some button is pressed, adding in inside of current switch, a new switch, we can handle the events from a specific buttons. Our events for handle should be events which interact with other elements of window. This is way at press at some button in this application is changed color of font of one textelement.

During development of this "application, it is possible to realize what in course of twenty years APIs for development of GUI evolved from a pour and terrible mistake of a nature, to an extreme developer-friendly programing interfaces.

3.3 Prove your work with screens

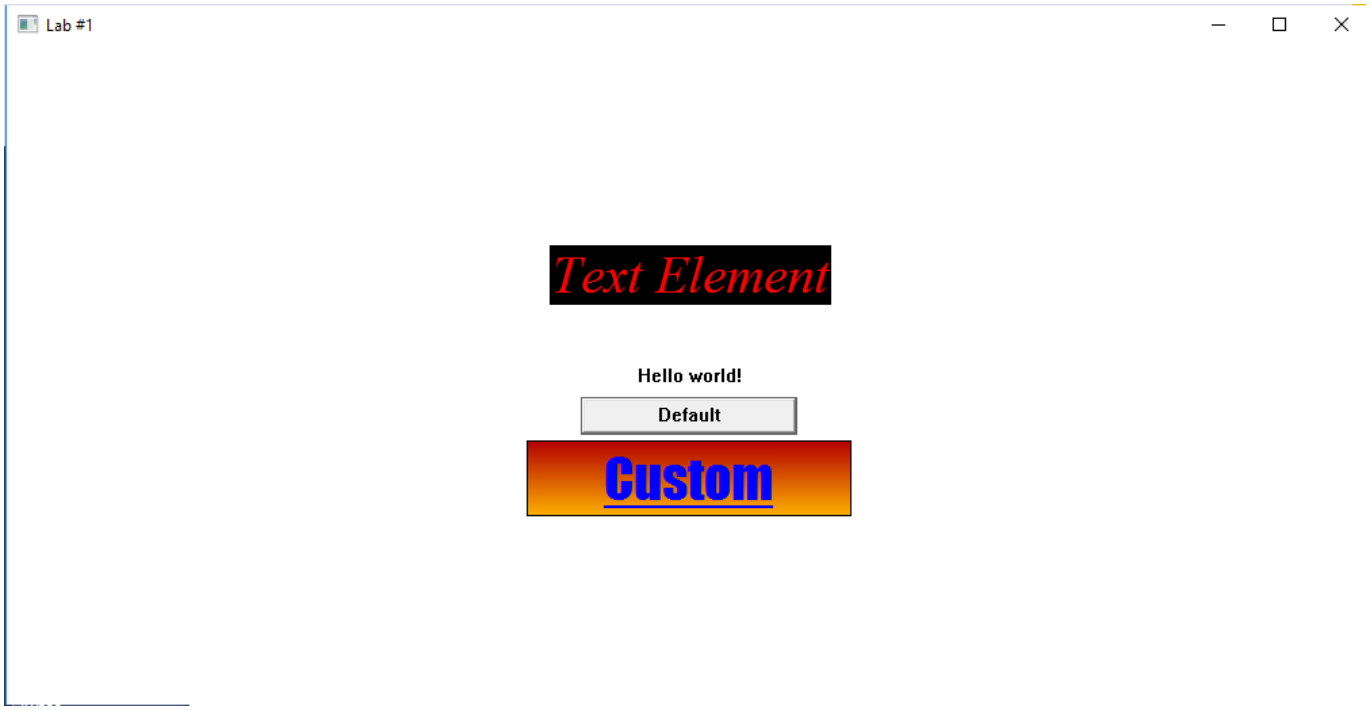


Figure 3.1 – Basic window, with required elements

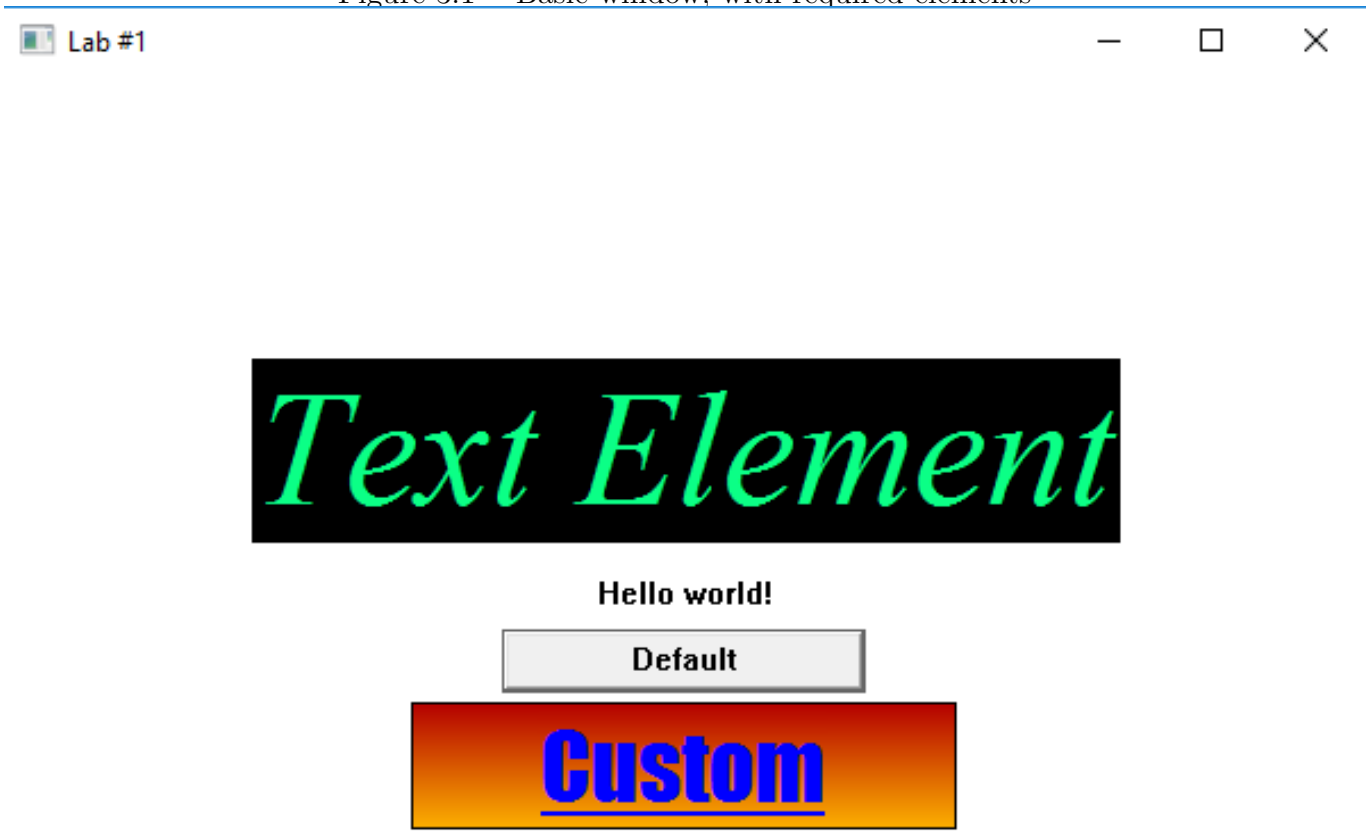
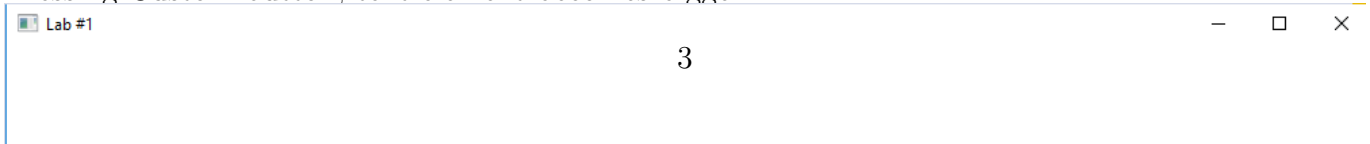


Figure 3.2 – Pressing Default button window becomes smaller.
Pressing Custom button, text element becomes bigger



Conclusions

During development of this application, it is possible to realize what in course of twenty years APIs for development of GUI evolved from a pour and terrible mistake of a nature, to an extreme developer-friendly programing interfaces.

References

1 Programming Windows by Charlez Petzold, 5th edition,

a) Section I, Chapter 1

b) Section I, Chapter 2

c) Section I, Chapter 3

d) Section I, Chapter 4

e) Section I, Chapter 9