Faculty of Computers, Informatics and Microelectronics

Technical University of Moldova

WINDOWS PROGRAMMING

Laboratory work #4

Windows Timer. Animation.

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1 Purpose of the laboratory

Gain knowledge about the basics of working with timer and animation.

2 Laboratory Work Requirements

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

a) Create an animation based on Windows timer which involves at least 5 different drawn objects.

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

a) Realize the tasks from Basic Level.

b) Increase and decrease animation speed using mouse wheel/from keyboard

c) Solve flicking problem describe in your readme/report the way you had implemented this

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

a) Realize the tasks from Normal Level without Basic Level.

b) Add 2 animated objects which will interact with each other. Balls that have different velocity and moving angles. They should behave based on following rules:

1) At the beginning you should have 3 balls of different colors of the same size
2) On interaction with each other, if they are of the same class (circle, square), they should change their color and be multiplied.
3) On interaction with the right and left wall (the margins of the window), they should be transformed into squares.
4) On interaction with the top and bottom of the window - the figures should increase their velocity.
5) Please, take into consideration that the user can increase and decrease animation speed using mouse wheel/from keyboard

– **Bonus point task:**

a) For the task above, add balls with mouse.

3 Laboratory work implementation

3.1 Tasks and Points

Basic Level (grade 5 —— 6):
- Create an animation based on Windows timer which involves at least 5 different drawn objects
Normal Level (grade 7 —— 8):
- Realize the tasks from Basic Level.
- Increase and decrease animation speed using mouse wheel/from keyboard
- Solve flicking problem describe in your readme/report the way you had implemented this

3.2 Laboratory work analysis

Repository:
https://github.com/StasBizdiga/WP

3.3 Proving my work

Basic level:

- All the required things are drawn: There are at least 5 different animated objects.

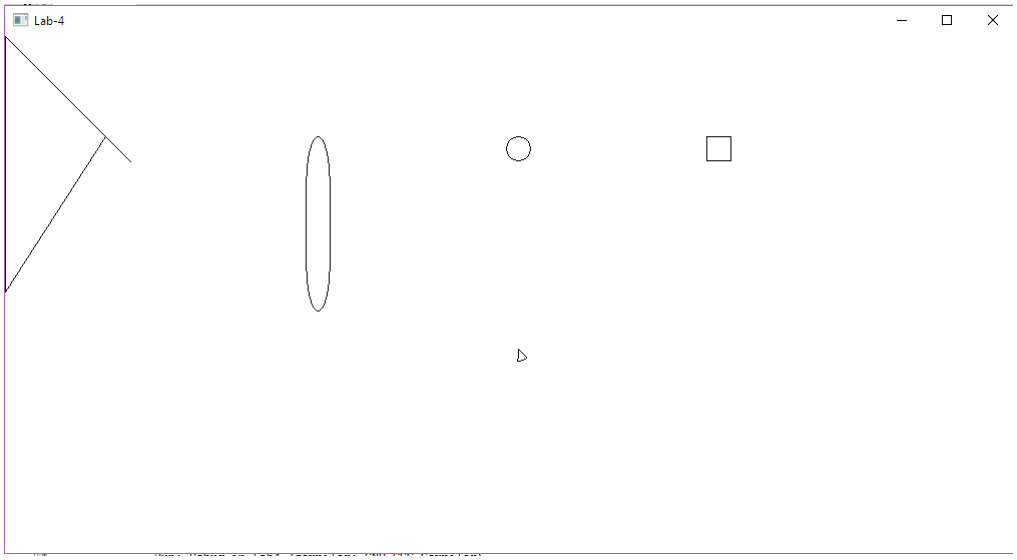
Normal level:

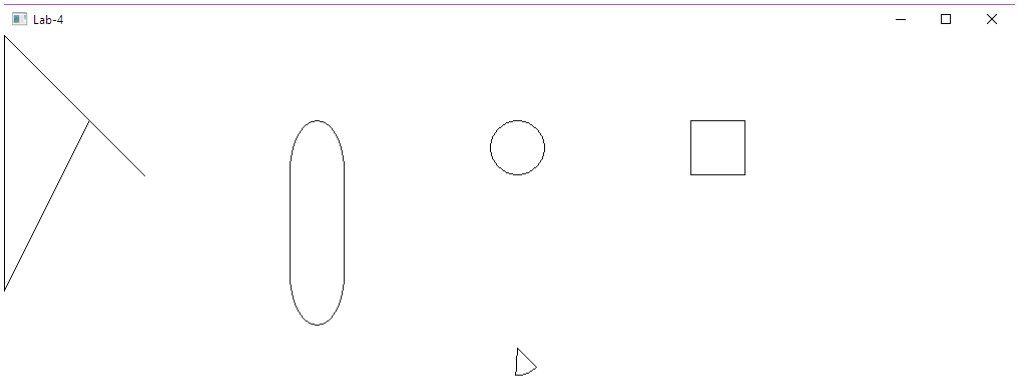
- You can change the animation speed with the mouse wheel. (See instructions below)
- Flickering doesn't seem to occur in my program but regardless, I've had a safe approach. When drawing any of the objects, as the program is about to draw the next frame of the same object, it draws it white first so that it is being erased ,thus we get a smooth, clean of errors animation.

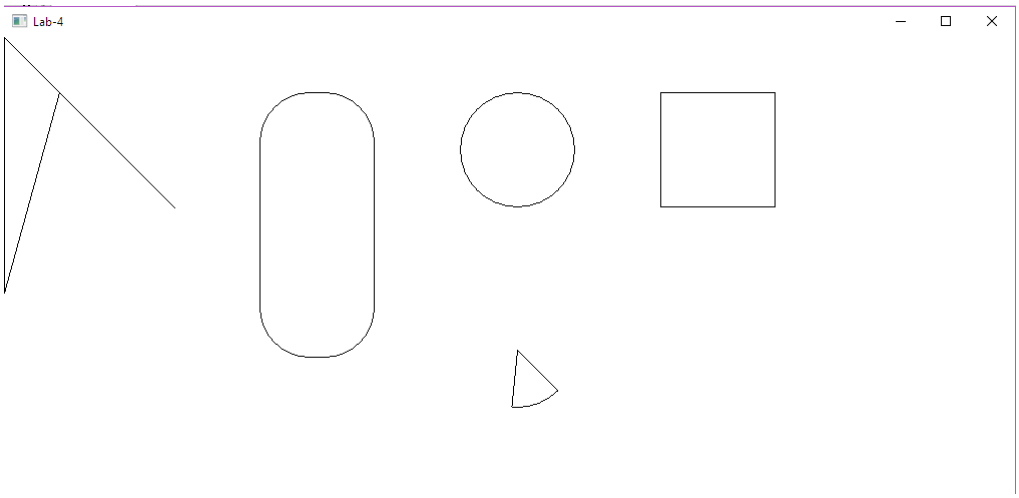
Hot-keys Instructions:
- Rolling the mouse wheel up accelerates the animation
- Rolling the mouse wheel down decelerates the animation

Additional Features:
- Animation is ping pong looped. There's a variable that is added to certain parameters, then by the middle animation frame it flips, subtracting, thus returning all back smoothly until the initial state. Then the cycle repeats.

The animation:







Conclusions

The current laboratory work was of great help since I studied about animations - an interesting and captivating topic, me being an artist myself. Starting with learning how to handle windows timer messages, I've grasped the way of working with animations within win32 API, since animations are simple frames put one after another at a certain rate. Thus I could perform it with the help of a timer and different adjustments to objects in the scene (device context). It was fun to complete therefore I'm excited to continue onward with the next laboratory work.