

FACULTY OF COMPUTERS, INFORMATICS AND MICROELECTRONICS

TECHNICAL UNIVERSITY OF MOLDOVA

WINDOWS PROGRAMMING

LABORATORY WORK #4

Windows Timer. Animation.

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1 Laboratory work 3

1.1 Tasks and Points

– **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) 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 begining you should have 3 balls of different colours 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

– **for Bonus Point Tasks :**

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

2 Laboratory work implementation

2.1 Tasks and Points

- **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:**
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 - 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
- **for Bonus Point Tasks :**
 - a) For the task above, add balls with mouse.

2.2 Prove your work with screens

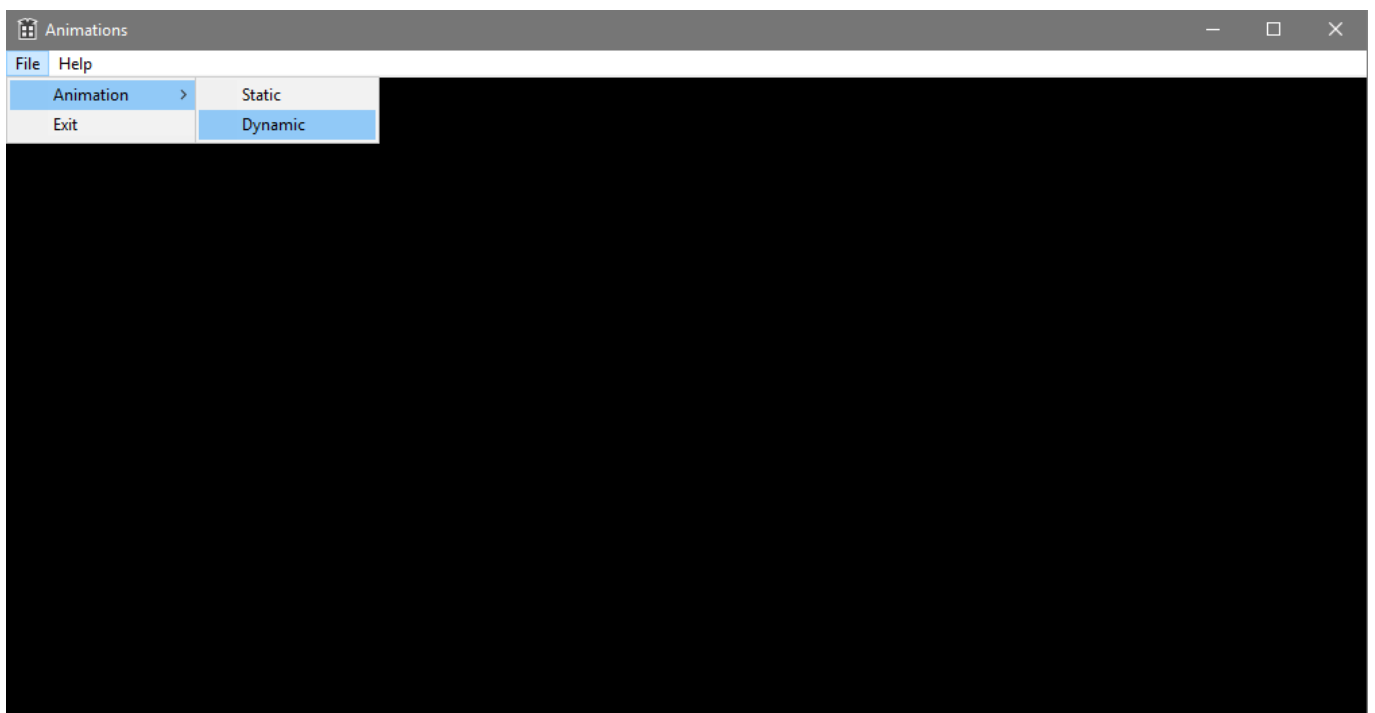


Figure 2.1– There are 2 options in menu first one which is "Static" is for first task to create 5 animated different objects , the obj changes their size but do not move.

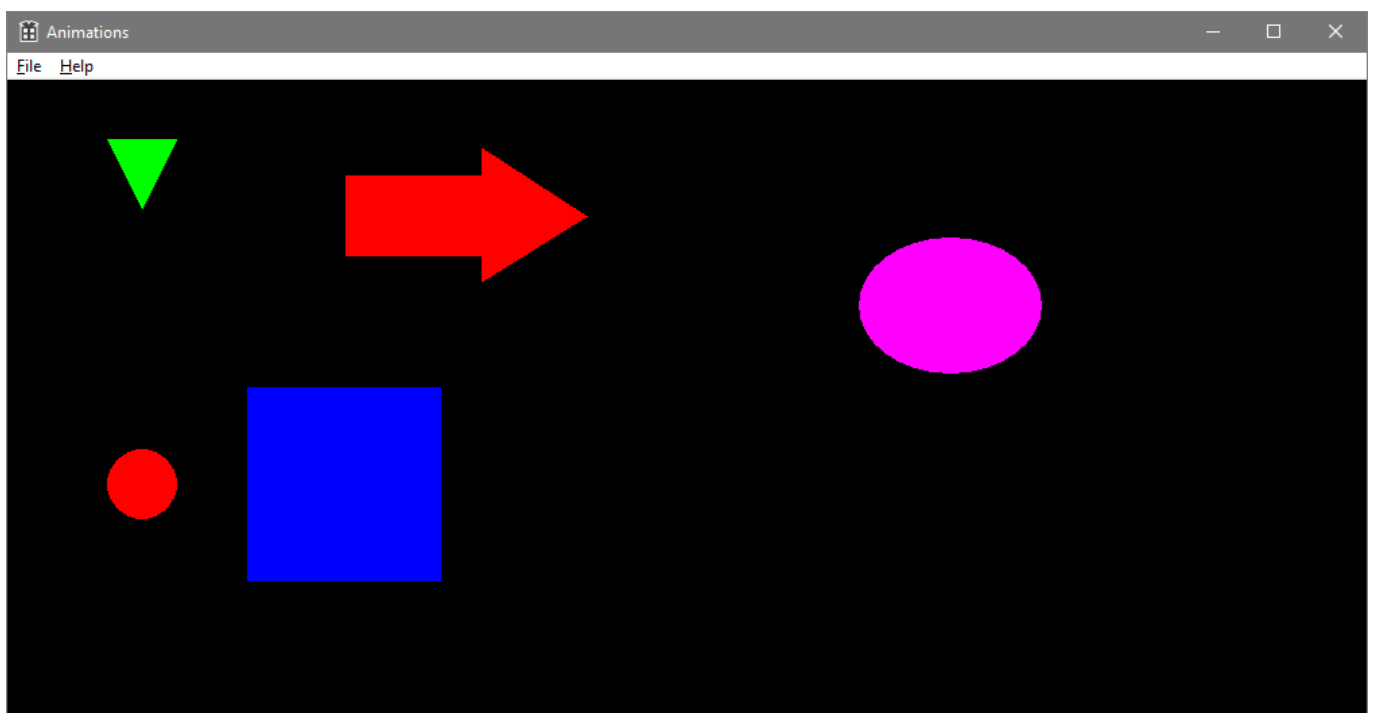


Figure 2.2– Animation of static option from menu.

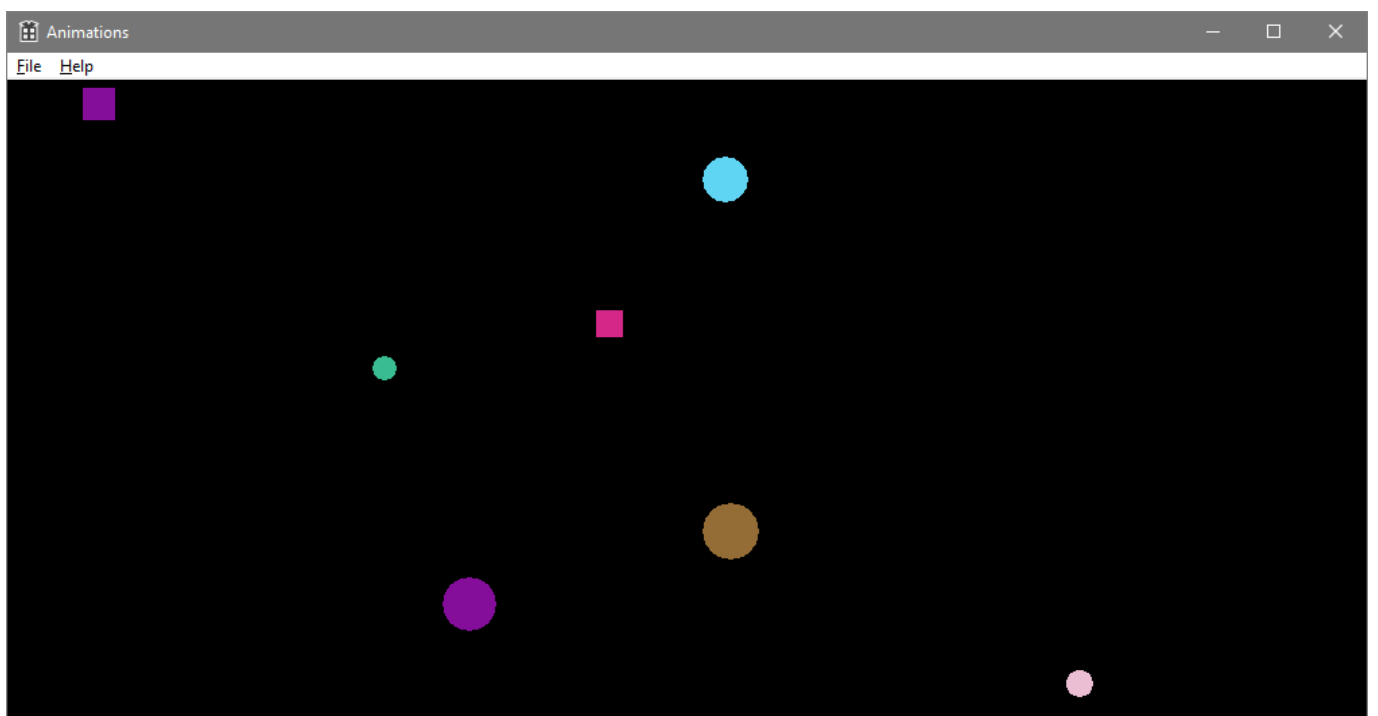


Figure 2.3– Animation of dynamic option from menu.

Conclusions

On my opinion this laboratory work was easier than previous, I've learned a lot of things starting from how to draw with double buffering to avoid flickering of shapes in window using winapi and and finishing with creating some animations by moving thous object using timer to update their positions. Well so I think that this laboratory work proves that WinApi in C++ can be use to make some simple animations and even more I think that it can be use to develop some awesome games.

References

- 1 Aldebran Robotics, *official page*, www.aldebaran.com/en
- 2 Timo Ojala, *Multiresolution gray-scale and rotation invariant texture classification with local binary patterns*, 2002
- 3 Biometric, www.biometricupdate.com/201501/history-of-biometrics