Faculty of Computers, Informatics and Microelectronics

Technical University of Moldova

Event-Driven Programming

Laboratory work #3

Authors:	Supervisor:
Ganusceac Vlad	Mihai Coslet

Laboratory work #3

1 Purpose of the laboratory

Basics of Working with Mouse. GDI Primitives. Bezier Curve.

2 Laboratory Work Requirements

Contents:

- Mouse
- Device context
- GDI Primitives
  - Line
  - Curve
  - Plane
  - Bitmap image
- Bezier curve

Mandatory Objectives:

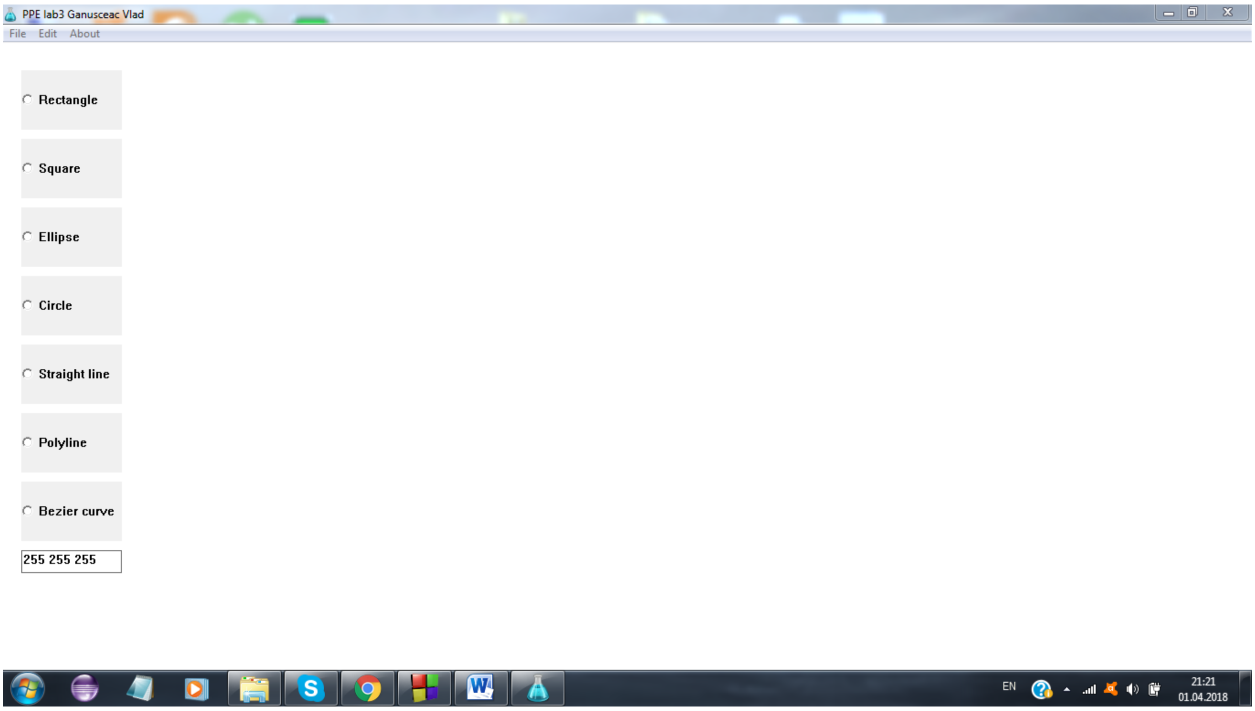
- Draw few lines of different colors and weights
- Draw a Bezier curve
- Draw few plane objects (ex. circle, square, pie, polygon...) of different colors, weights, filled and not
- Draw 2 different objects using mouse

Objectives With Points:

- Draw a custom bitmap image (1 pt)
- Add a switch (button, select list...) that will change mouse ability to draw objects (2 pt)
- Draw a Bezier curve using mouse (1 pt)
- Fill an object with a gradient (1 pt)
- Delete objects using mouse clicking (2 pt)
- Use mouse as an eraser of:
  - a fixed width (1 pt)
  - a adjustable width (2 pt)
- Zoom in and out application working area using keyboard (2 pt)

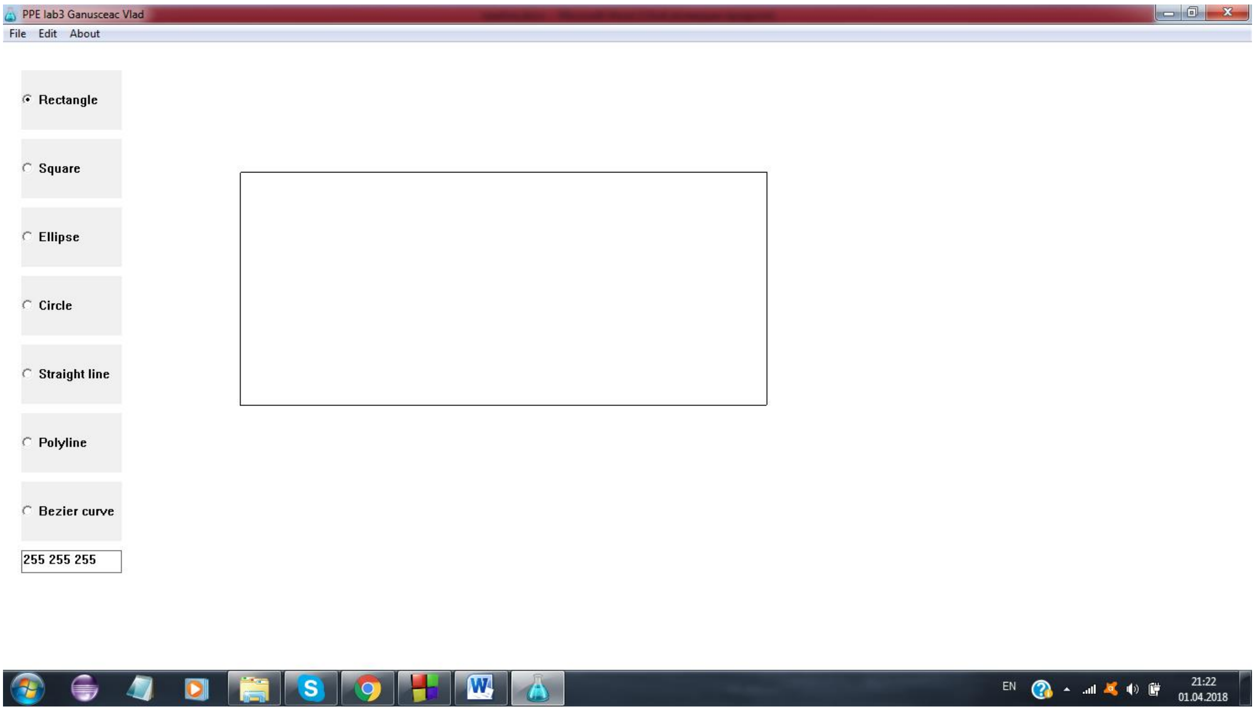
3 Laboratory work implementation

Here is how looks the application’s interface:



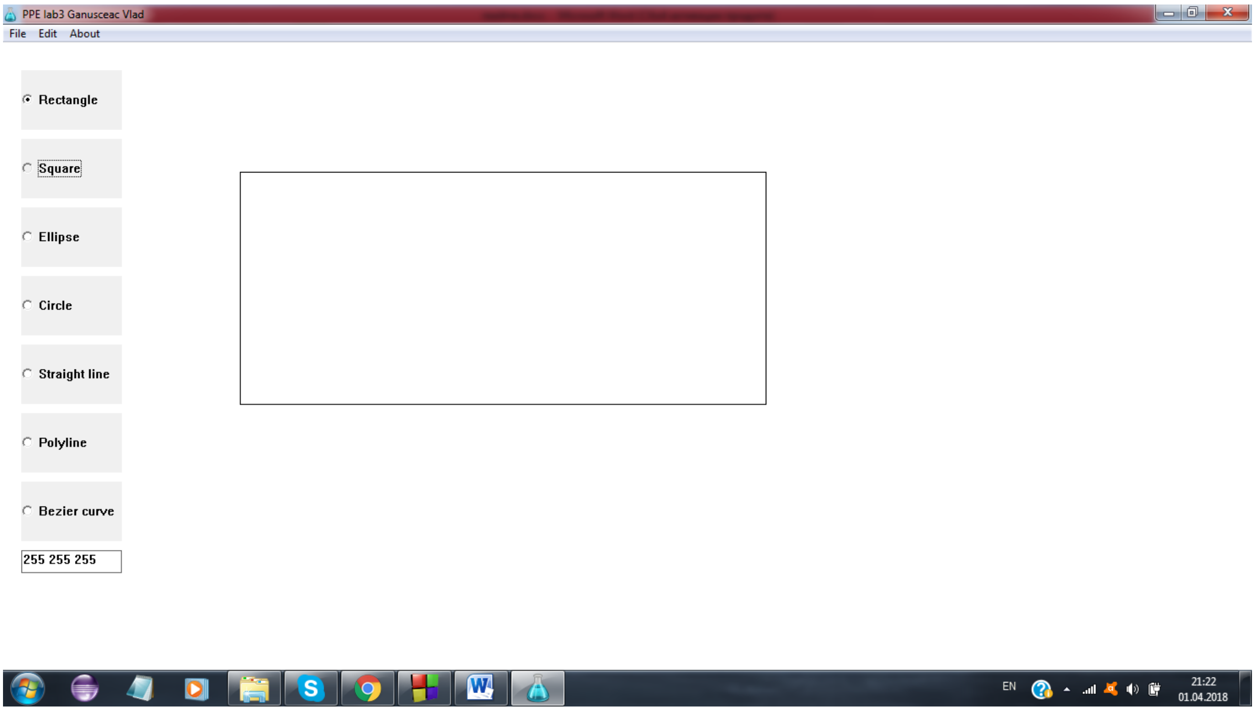
255 255 255

Let draw a RECTANGLE:



255 255 255

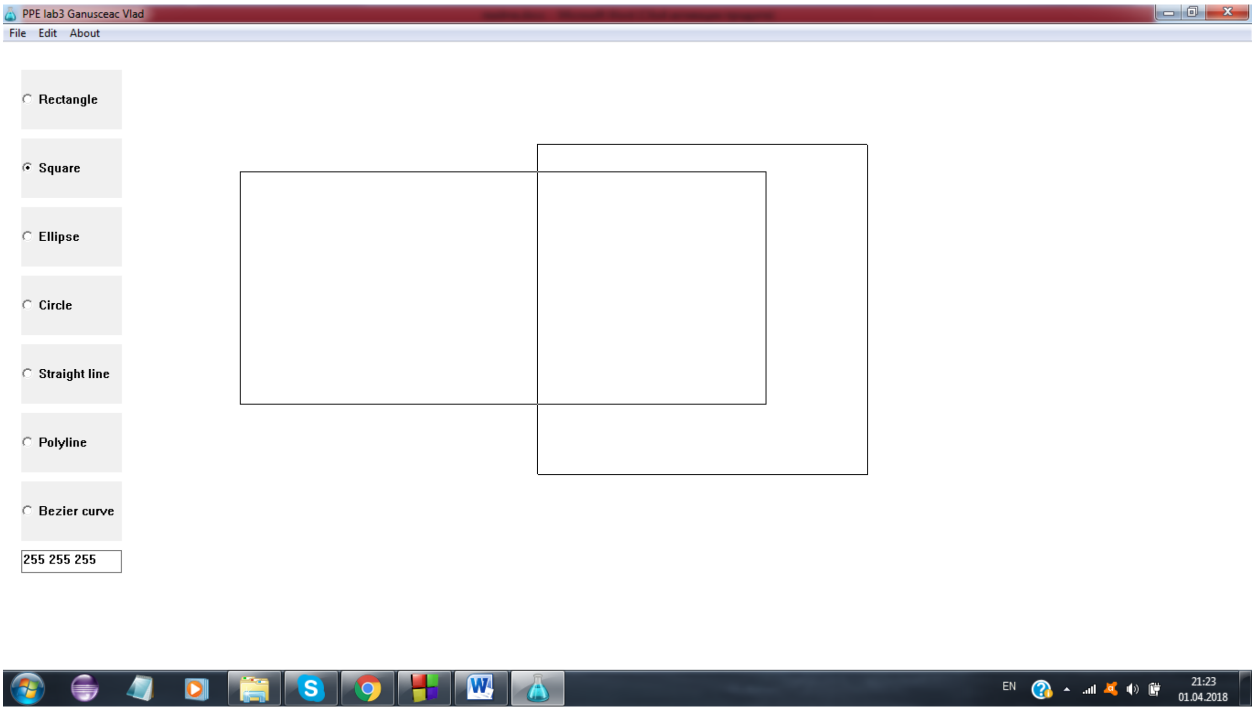
Let set now a square. The rectangle has white body and black borders, because by default drawing color is white (RGB(255,255,255)).



● Rectangle
○ Square
○ Ellipse
○ Circle
○ Straight line
○ Polyline
○ Bezier curve

255 255 255

We did not draw the square yet. It will be drawn when we will unclick the left button of mouse.

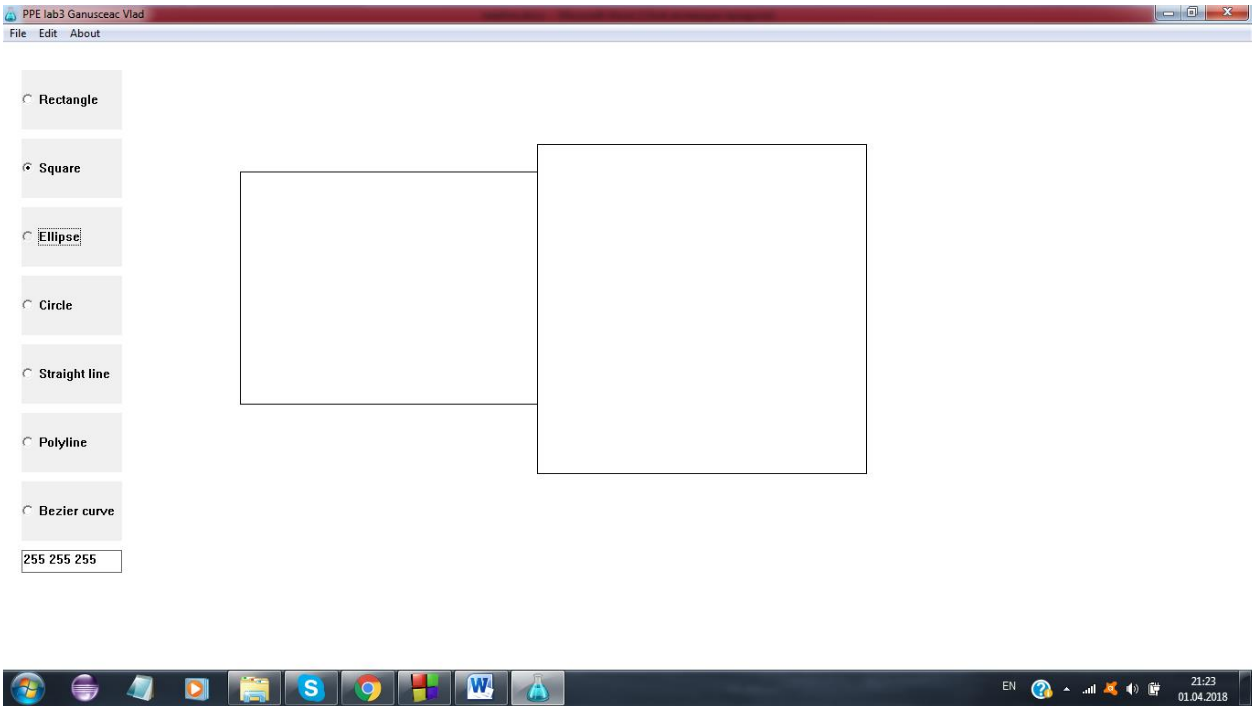


○ Rectangle
● Square
○ Ellipse
○ Circle
○ Straight line
○ Polyline
○ Bezier curve

255 255 255

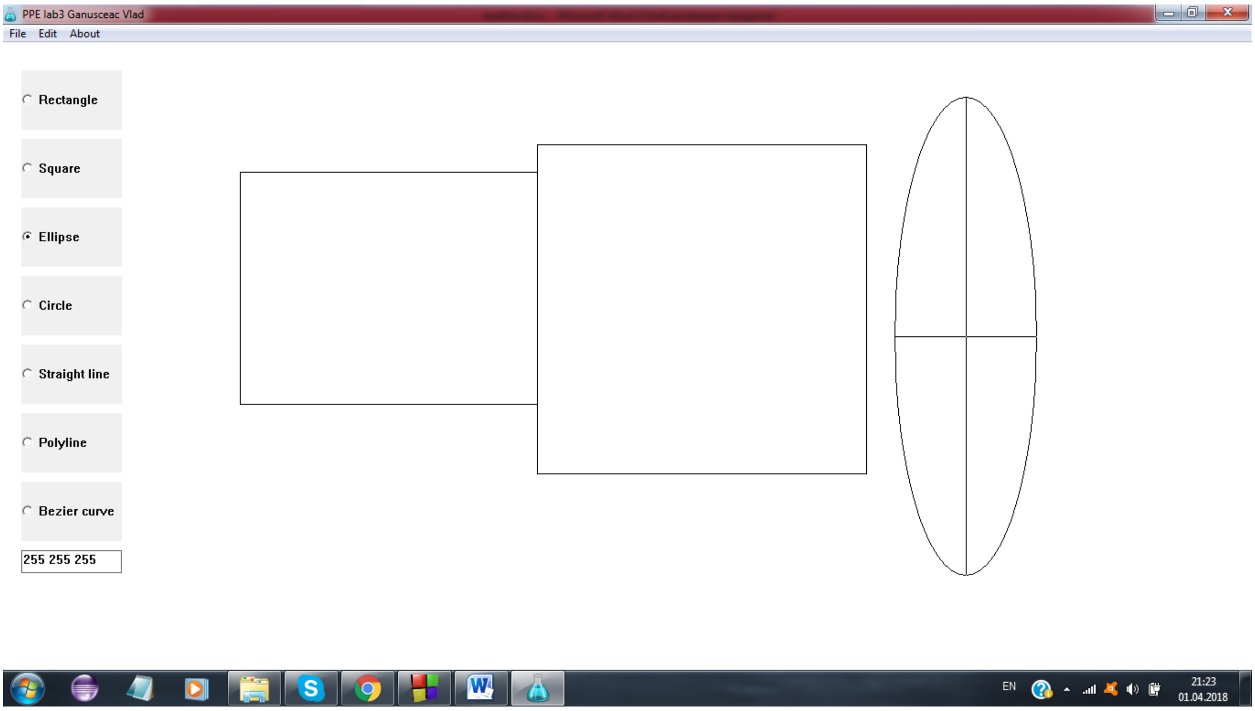
The SQUARE is drawn. The meaning of drawing procedure is simple:

1. Choose the figure to draw;
2. Click in the window the start point of the figure (wit left button of mouse);
3. Move the cursor;
4. Unclick the left button of mouse.



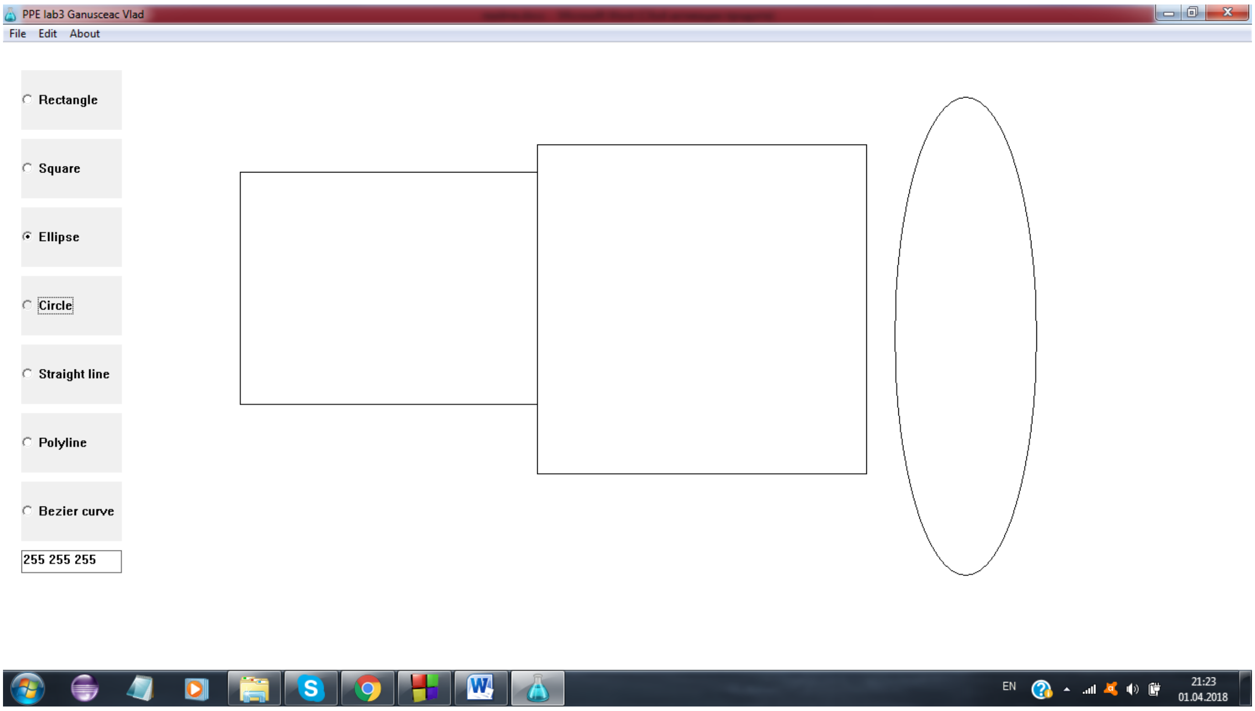
○ Rectangle
● Square
○ Ellipse
○ Circle
○ Straight line
○ Polyline
○ Bezier curve

255 255 255

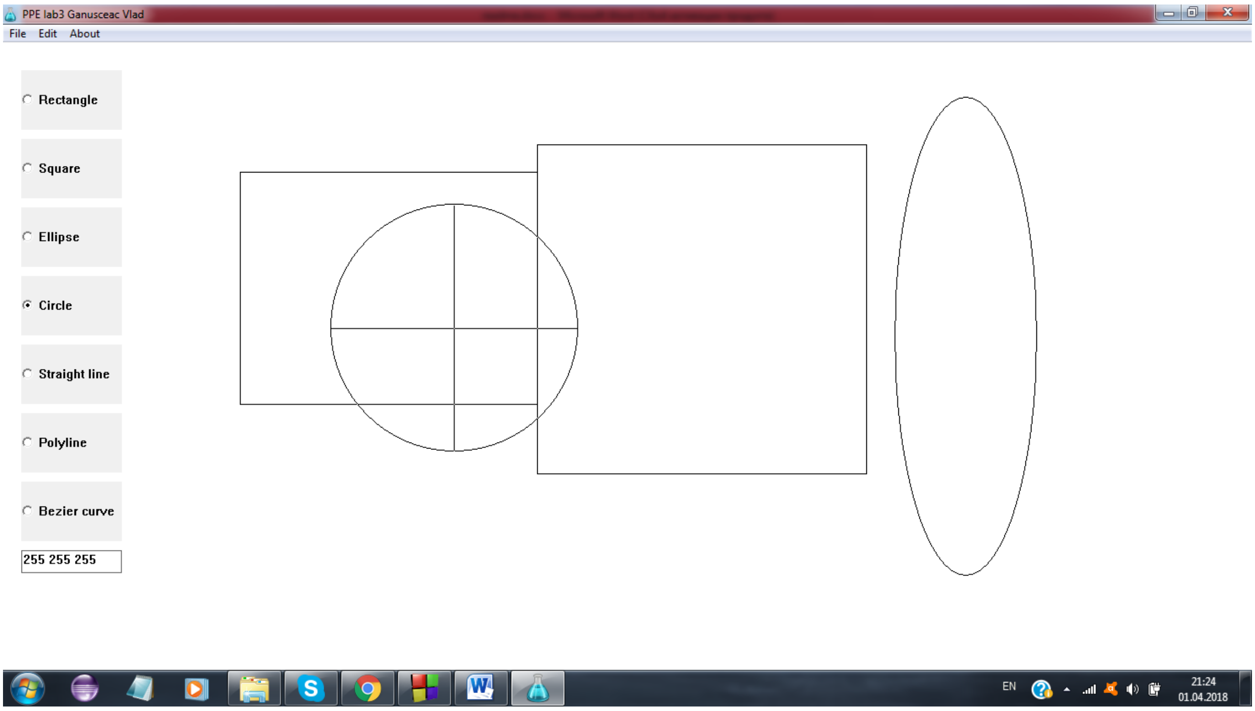


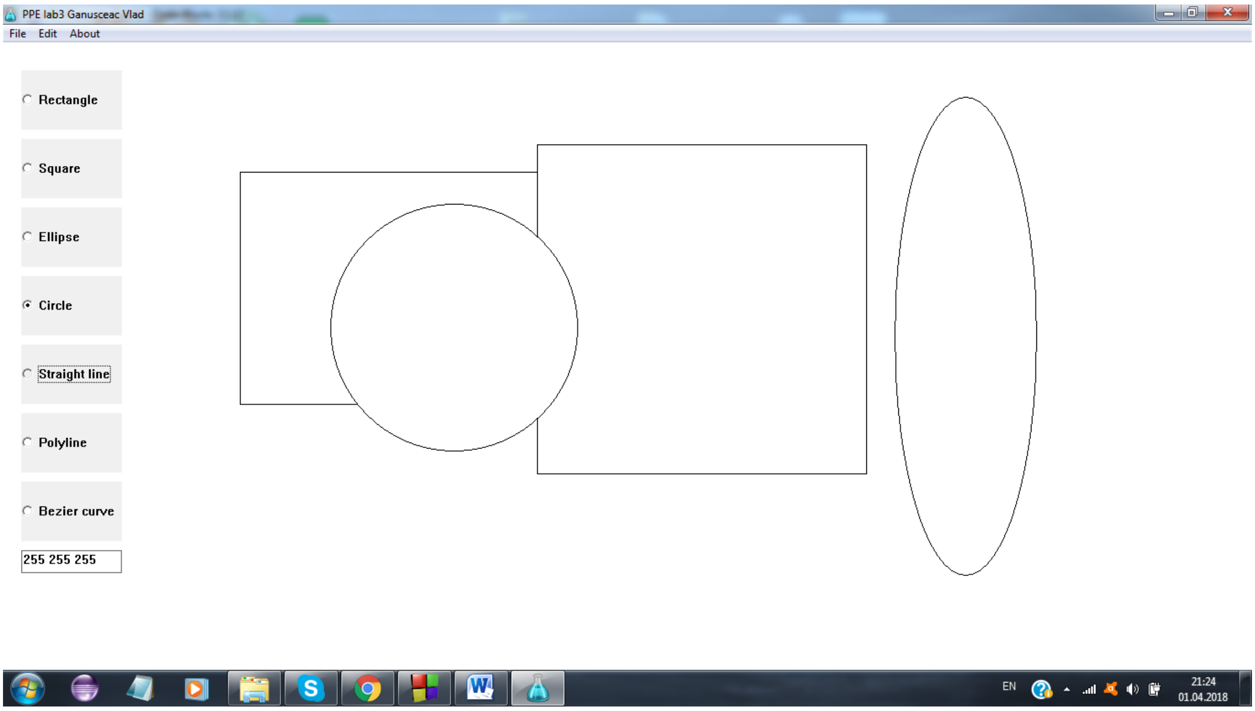
○ Rectangle
○ Square
● Ellipse
○ Circle
○ Straight line
○ Polyline
○ Bezier curve

255 255 255



Let do this procedure with another figures:





○ Rectangle

○ Square

○ Ellipse

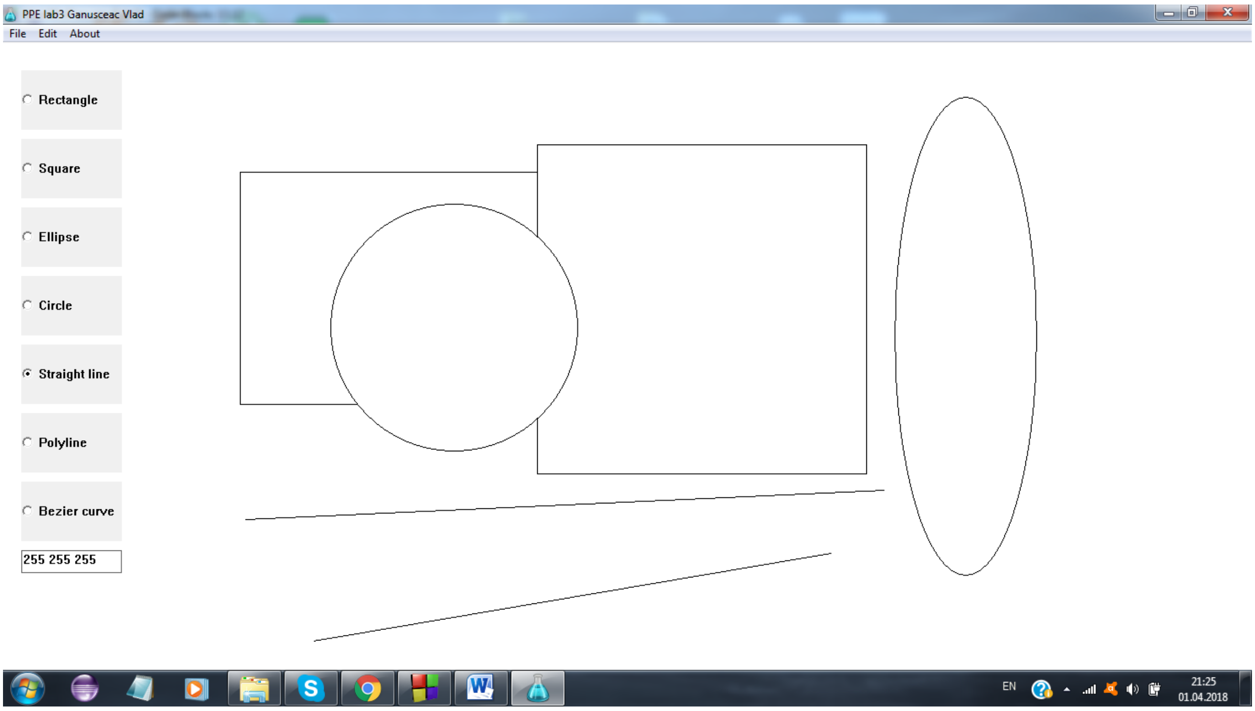
● Circle

○ Straight line

○ Polyline

○ Bezier curve

255 255 255



○ Rectangle

○ Square

○ Ellipse

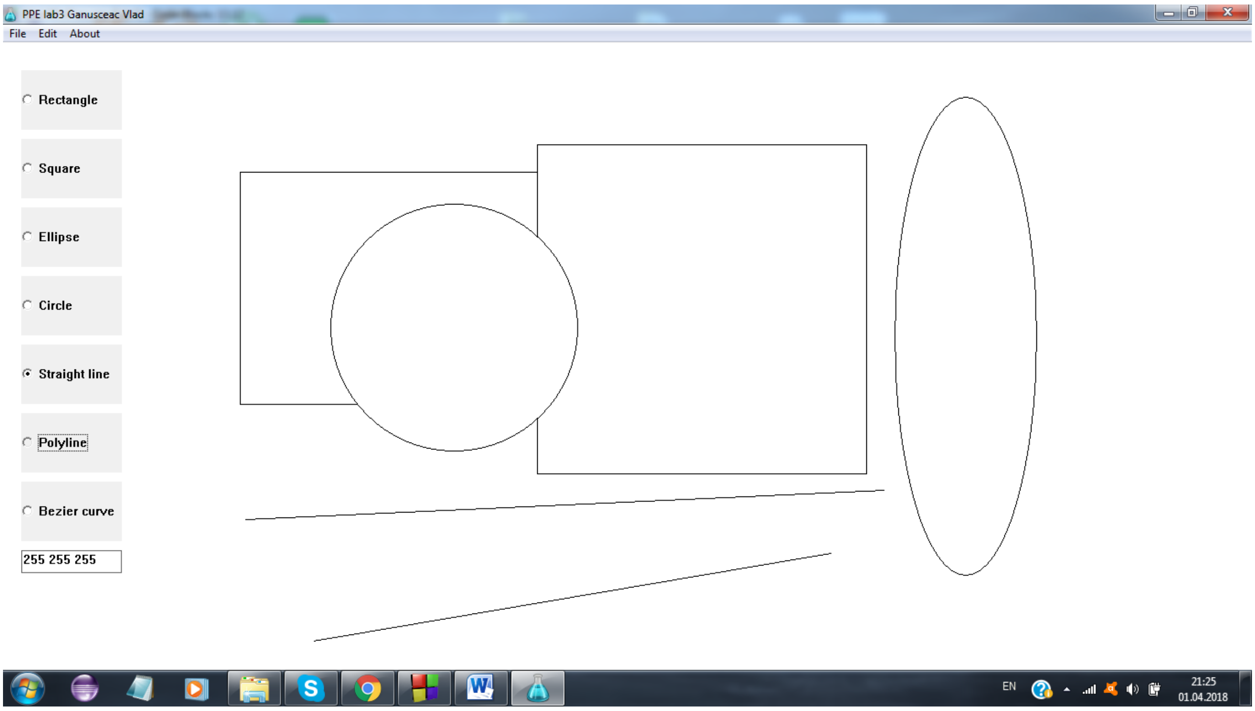
○ Circle

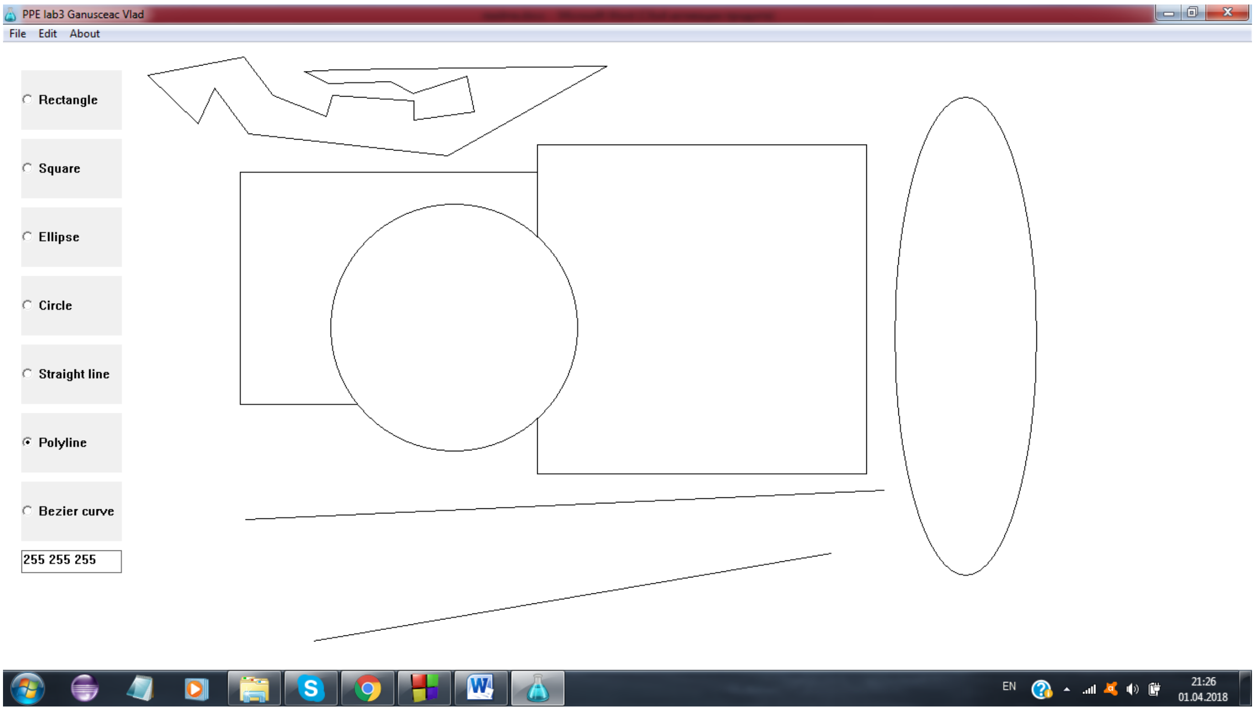
● Straight line

○ Polyline

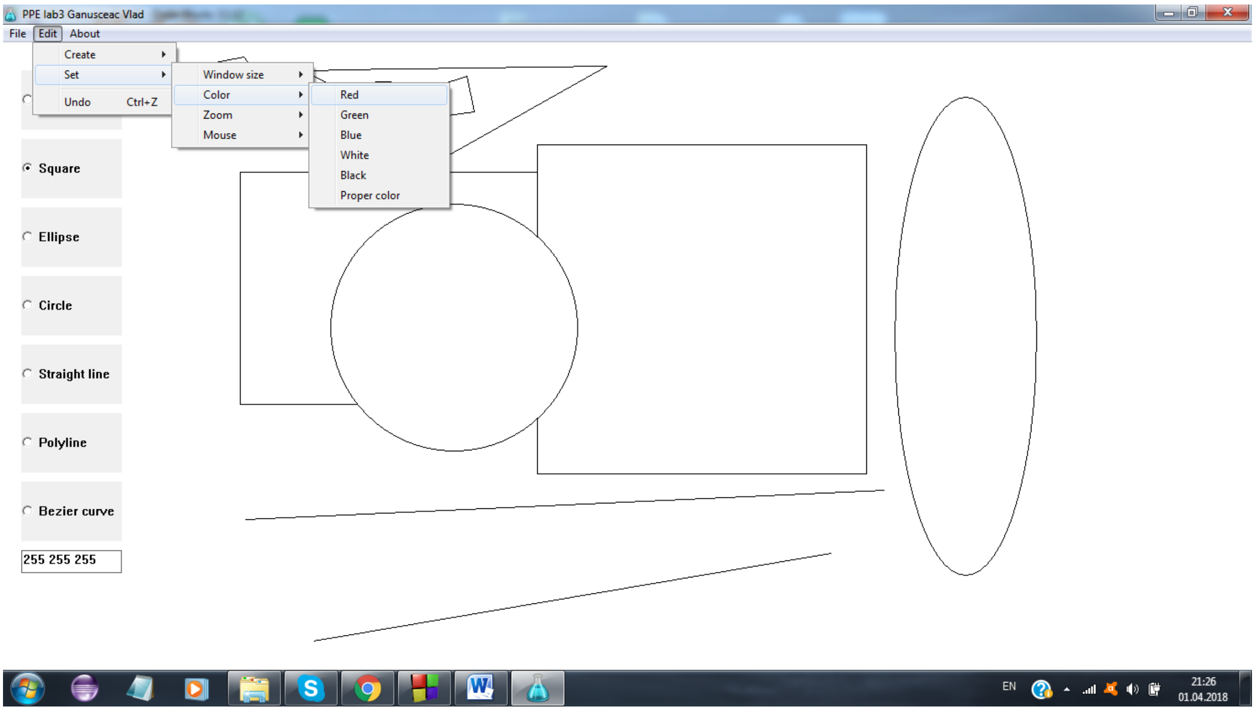
○ Bezier curve

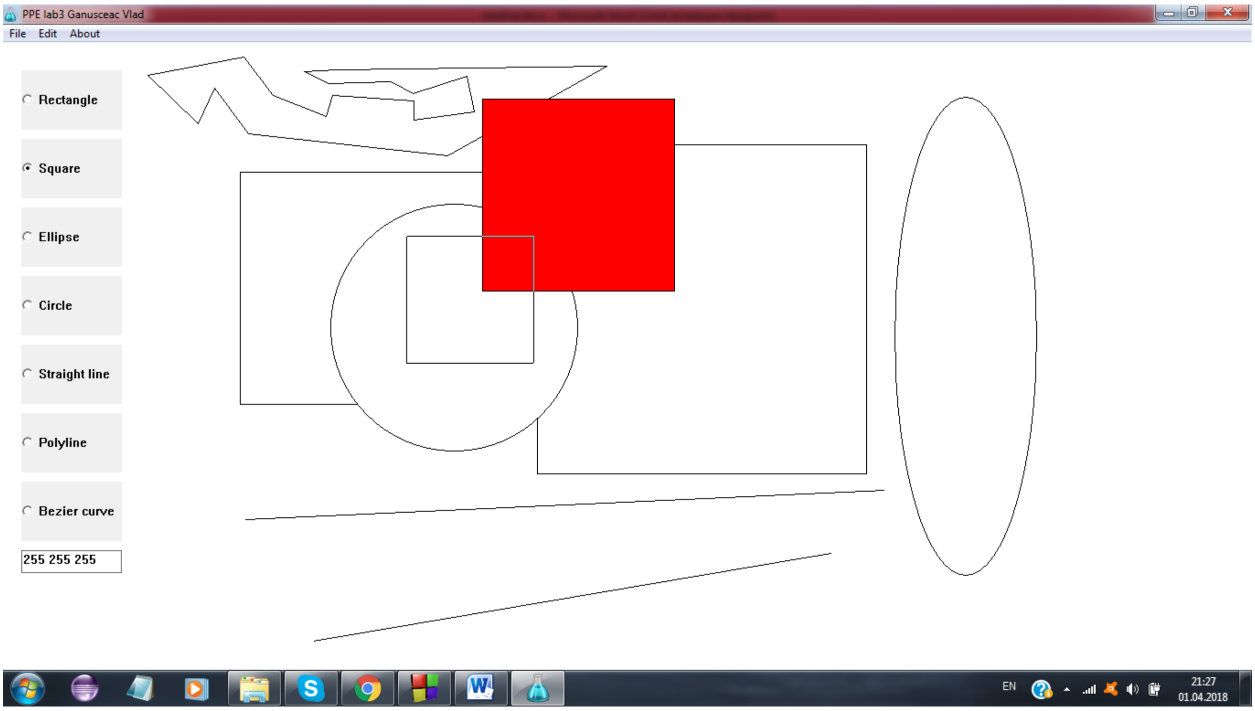
255 255 255

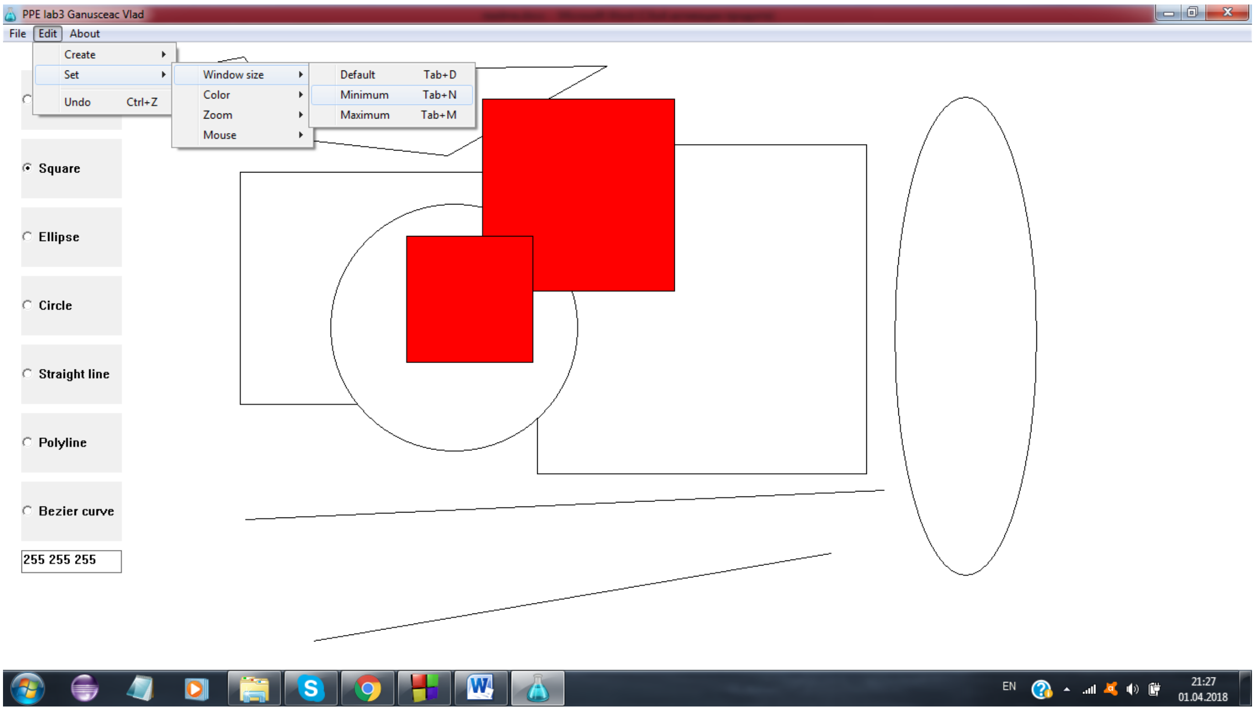

PPE lab3 Ganusceac Vlad
File
Edit
About
○ Rectangle
○ Square
○ Ellipse
○ Circle
● Straight line
○ Polyline
○ Bezier curve
255 255 255
EN
21:25
01.04.2018


PPE lab3 Ganusceac Vlad
File
Edit
About
○ Rectangle
○ Square
○ Ellipse
○ Circle
○ Straight line
● Polyline
○ Bezier curve
255 255 255
EN
21:26
01.04.2018

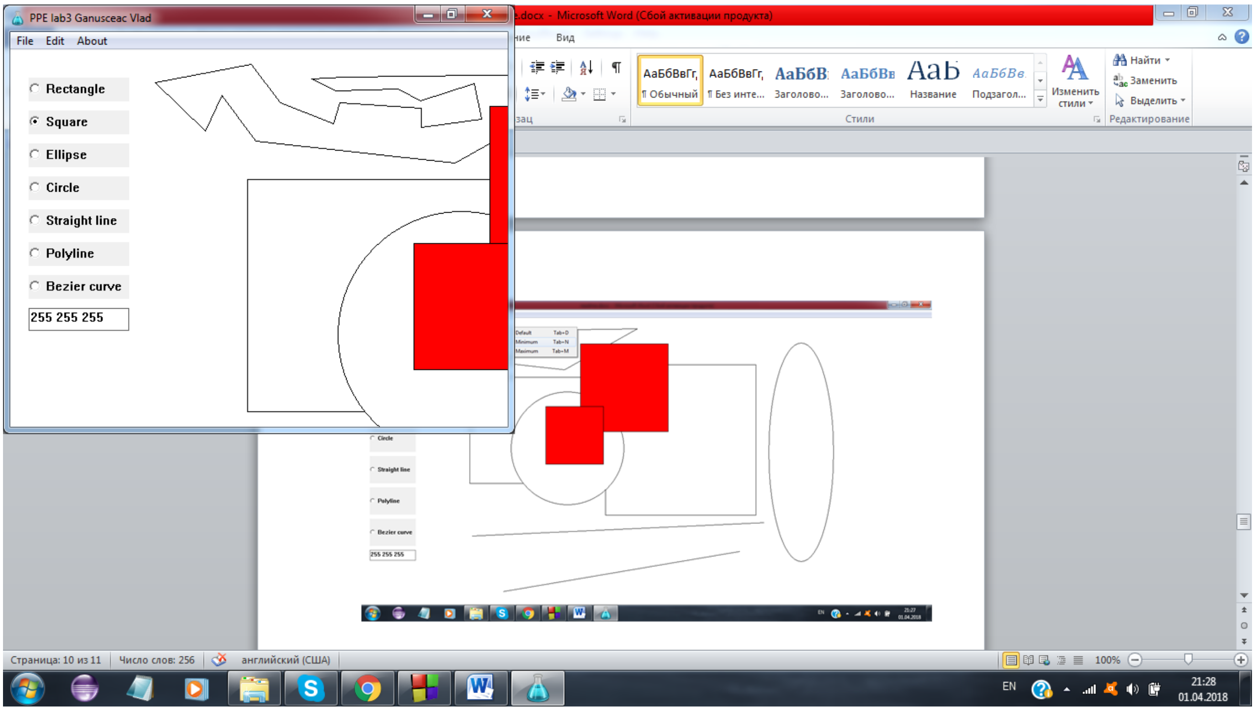
Let choose another color for drawing! For example, RED.

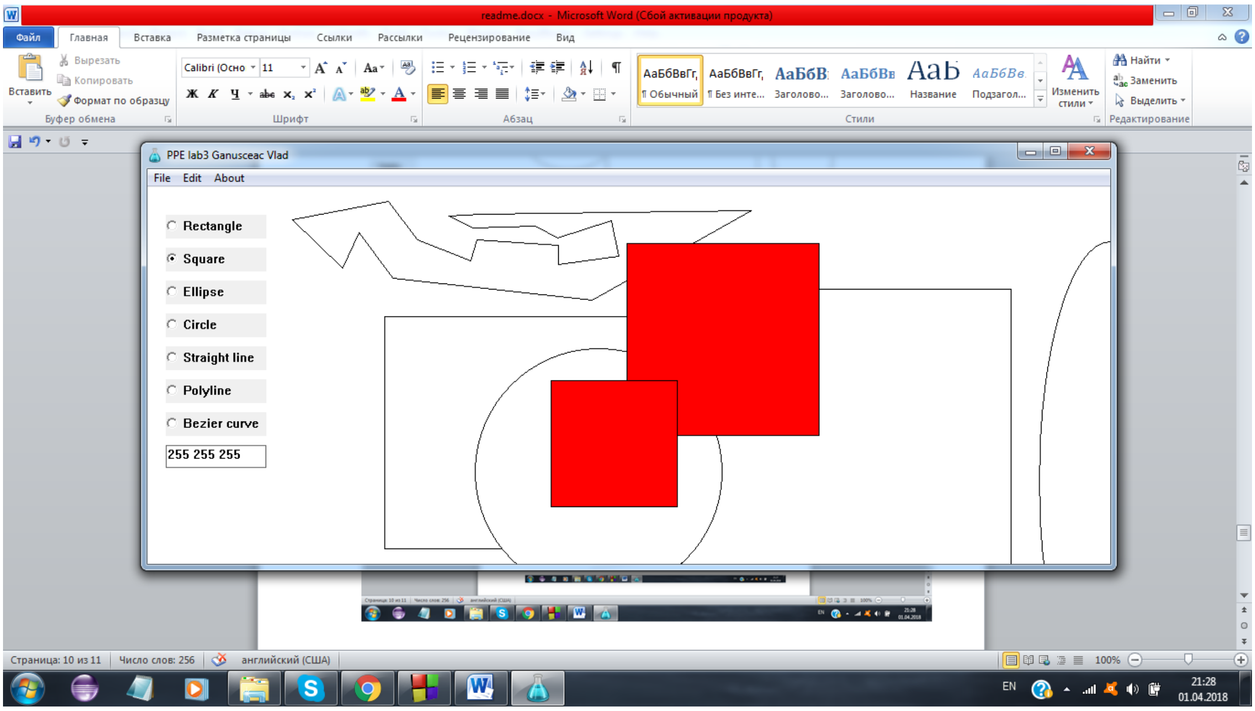






Even after resizing the figures are in their places. It is because I used al vector of the special struct where I keep all coordinates and another figure's characteristics.





○ Rectangle

● Square

○ Ellipse

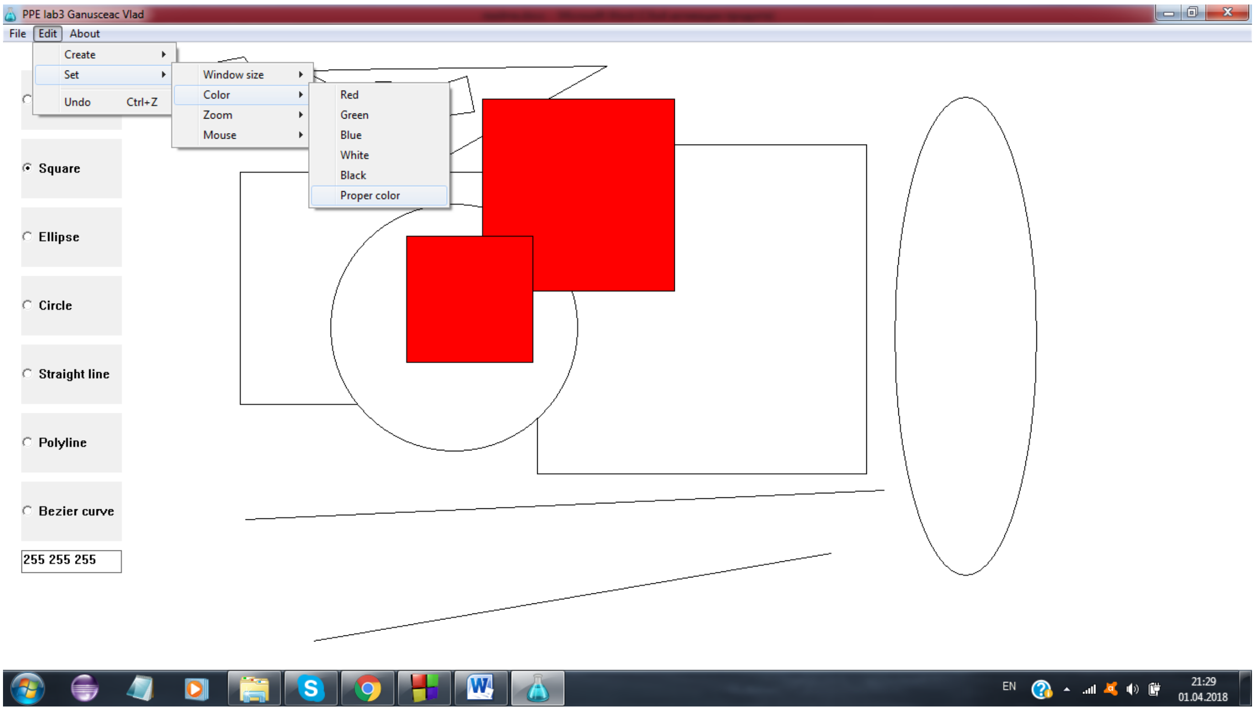
○ Circle

○ Straight line

○ Polyline

○ Bezier curve

255 255 255



● Square

○ Ellipse

○ Circle

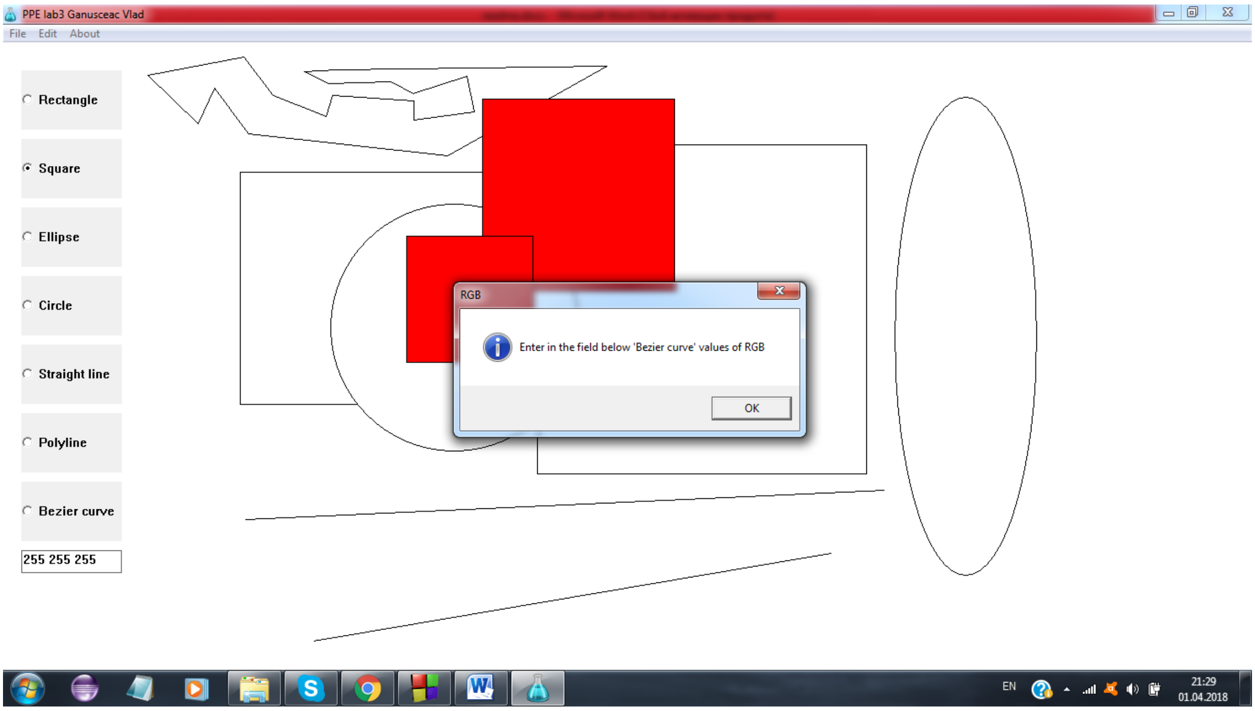
○ Straight line

○ Polyline

○ Bezier curve

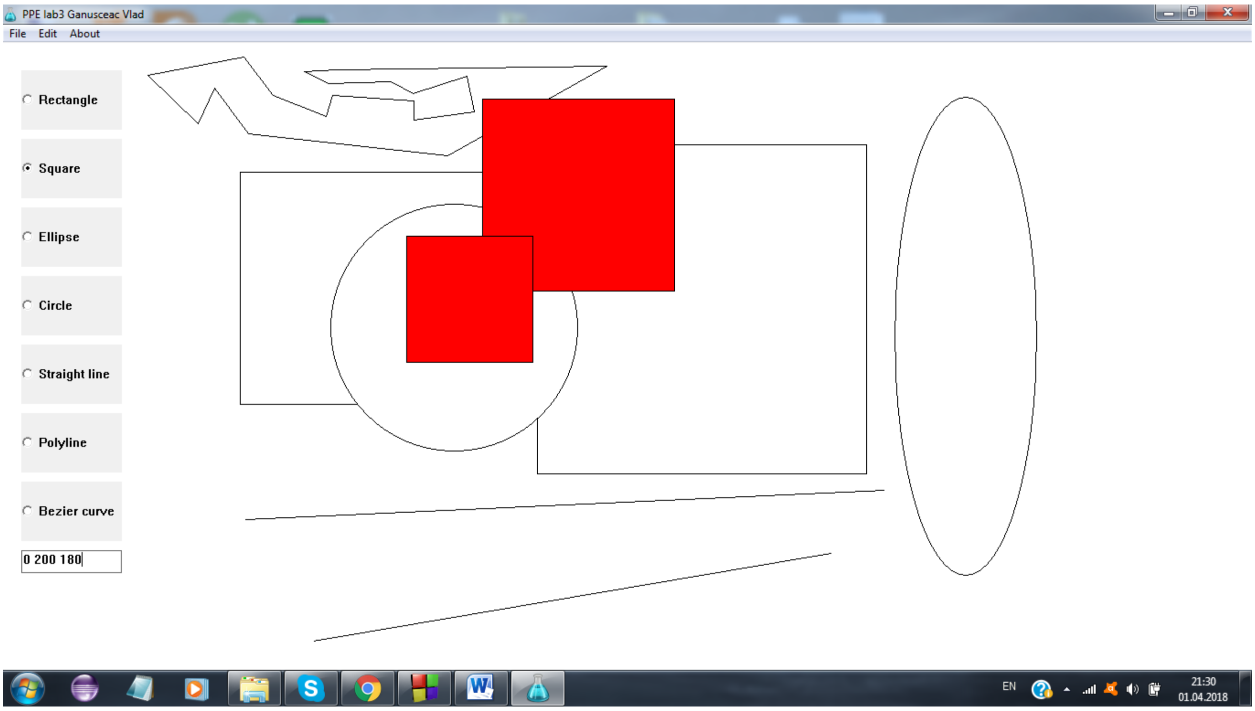
255 255 255

We can set our PROPER color…   255 * 255 * 255 different colors are available!

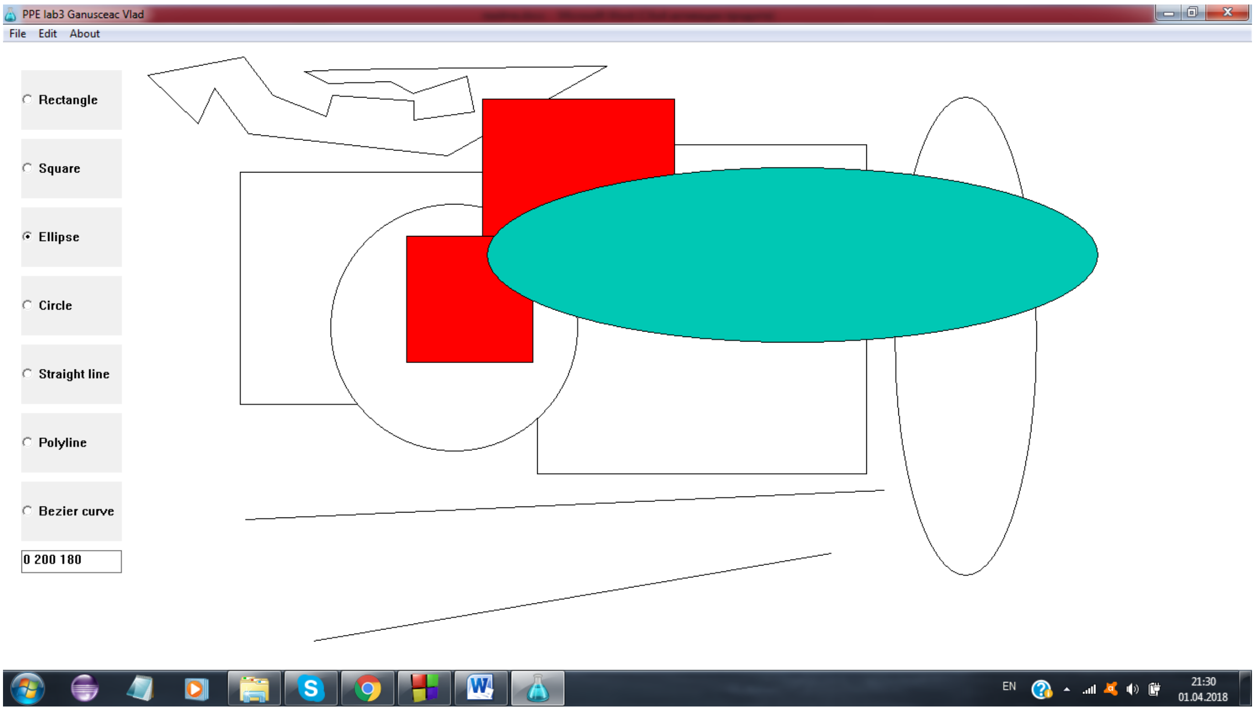


Enter in the field below 'Bezier curve' values of RGB

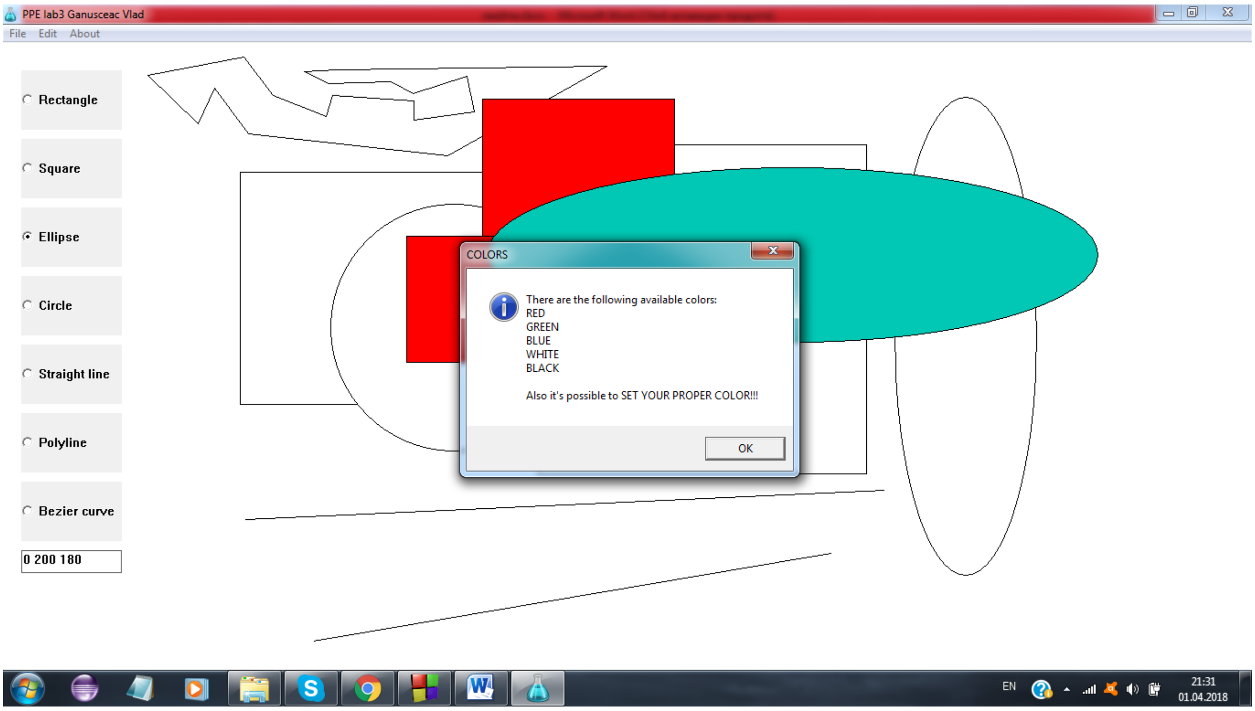
255 255 255



0 200 180



0 200 180



0 200 180

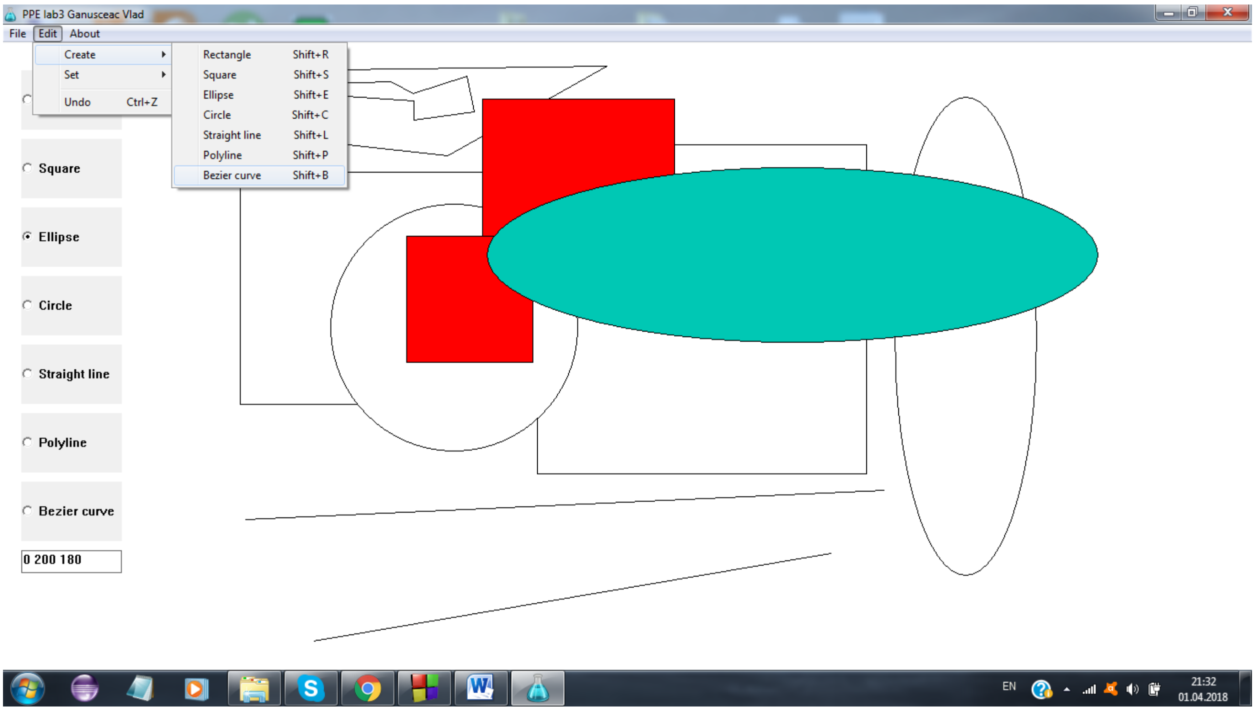
COLORS

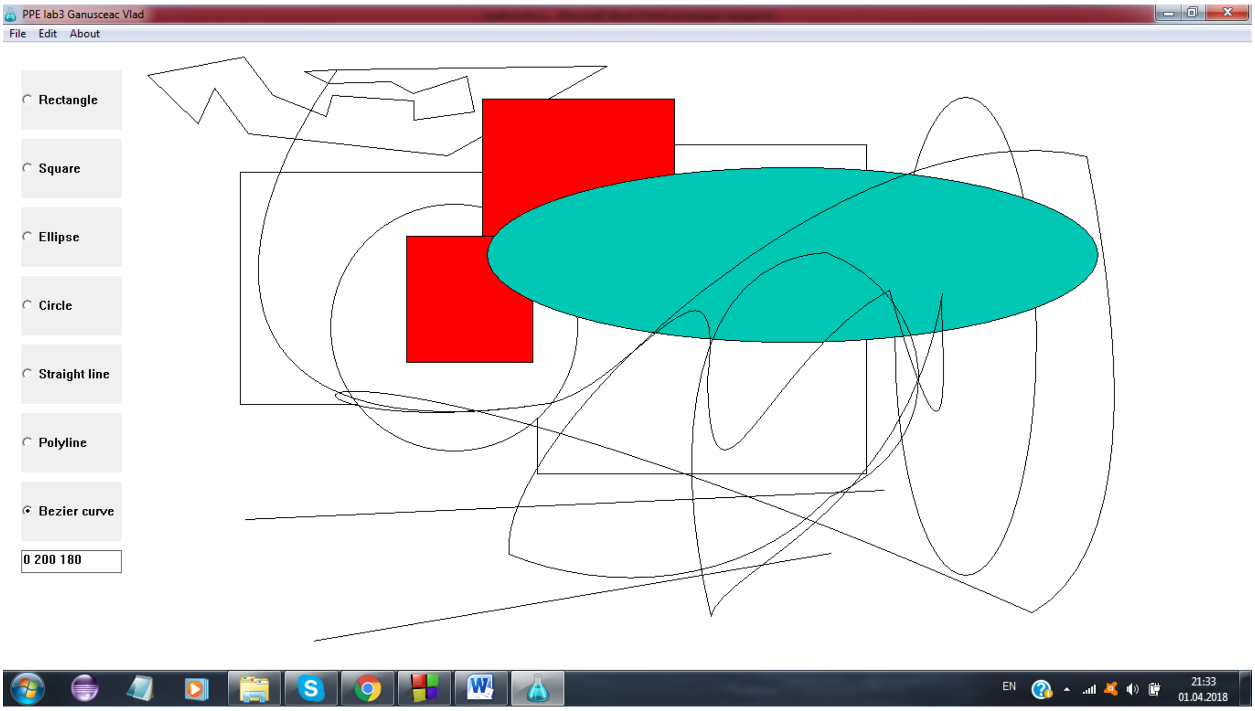
There are the following available colors:
RED
GREEN
BLUE
WHITE
BLACK

Also it's possible to SET YOUR PROPER COLOR!!!

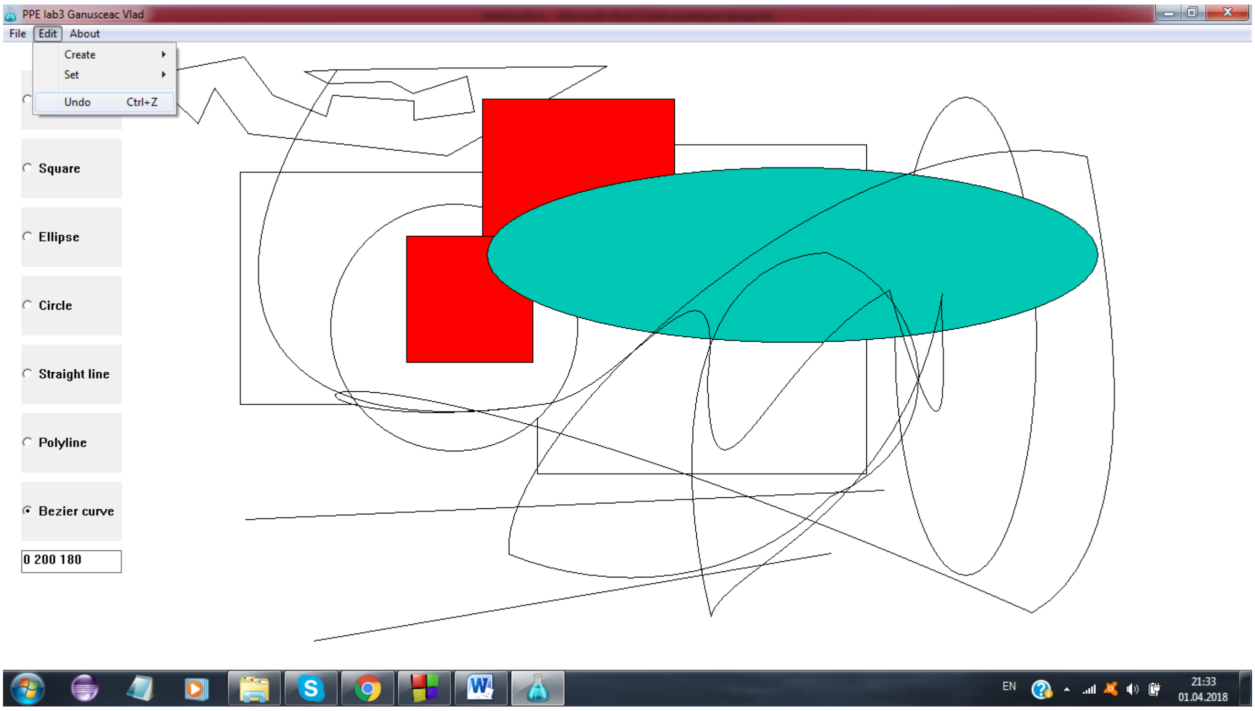
Let draw a BEZIER CURVE. We can choose it (also and as other figures) by

1. Combinations of buttons;
2. Using Menu;
3. Clicking for corresponding radiobox button.



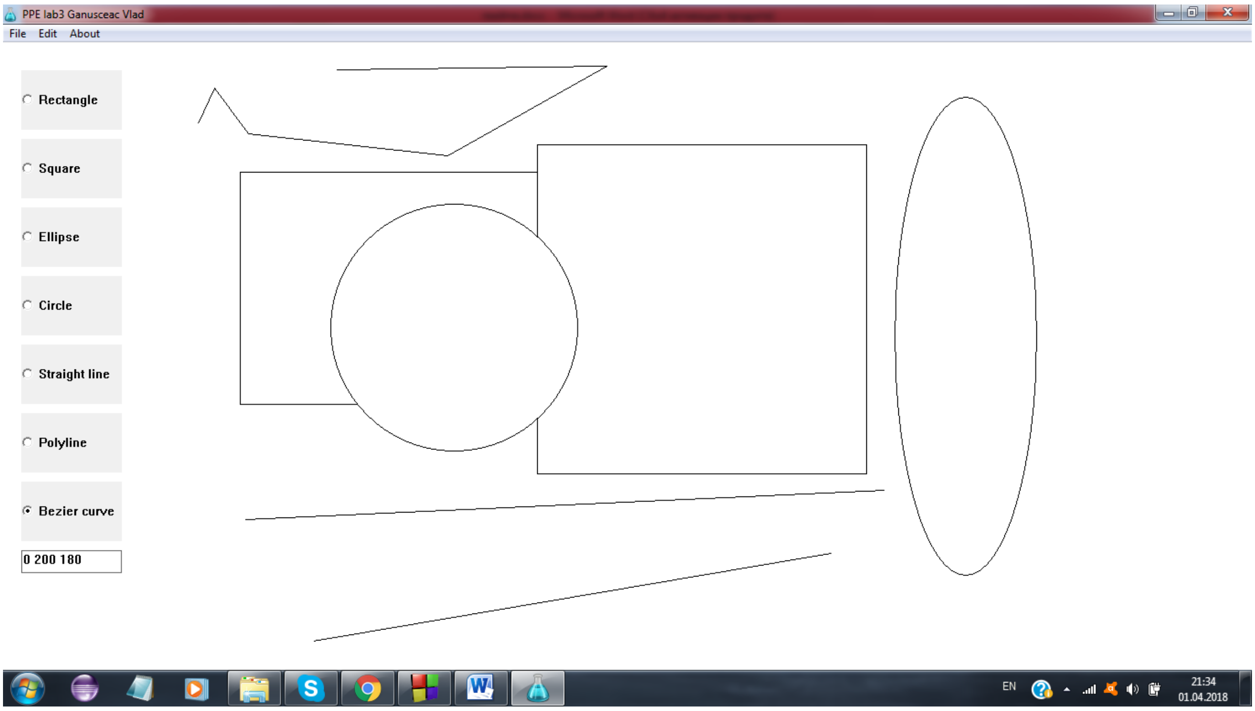


The ‘UNDO’ option is implemented! We can delete the last drawn figures.



● Bezier curve

0 200 180



● Bezier curve

0 200 180

Conclusion:

In this laboratory work we have implemented different primitives such as LINES, POLYLINES, SQUARES, RECTANGLES, ELLIPSES, CIRCLES and BEZIER CURVES. Each of these primitives can be selected by COMBINATION OF BUTTONS, MAIN MENU, CLICKING CORRESPONDING RADIOBOX by the mouse. The figures keeps their POSITION, FORM and SIZE even after RESIZING of the window. It is because the special vector structure has been implemented! The usage of the vector gives the possibility to the user to erase his/her last drawn figure(s) – command 'UNDO' or CTRL+Z. The functionality of application is provided in different ways: keyboard, menu, mouse.

References:

Programming Windows by Charlez Petzold, 5th edition: (Section I, Chapters 5, 7)

http://www.frolov-lib.ru/books/bsp/v14/ch2_3.htm (Графический интерфейс GDI в Microsoft Windows)

http://radiofront.narod.ru/htm/prog/htm/winda/api/paint.html#10 (Как рисовать в Windows)