[1. Multiples shapes together (1 – User Interface)](#_heading=h.30j0zll)

[2. Line segments (1 – Functional)](#_heading=h.1fob9te)

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[5. Default window (1 – User Interface)](#_heading=h.tyjcwt)

[6. Menu of available shapes (1 – User Interface)](#_heading=h.3dy6vkm)

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[8. Color picker for choosing the contour color (2 – User Interface)](#_heading=h.4d34og8)

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[10. Shapes with colored contour (2 – Functional)](#_heading=h.17dp8vu)

[11. Colored shapes (2 – Functional)](#_heading=h.3rdcrjn)

[12. Option bar on top of the window (2 – User Interface)](#_heading=h.26in1rg)

[13. Save a drawing (2 – Business Flow)](#_heading=h.lnxbz9)

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[15. Focus a shape (3 – Business Flow)](#_heading=h.1ksv4uv)

[16. Menu of available operations on a shape (3 – User Interface)](#_heading=h.44sinio)

[17. Moving an already inserted shape (4 – Business Flow)](#_heading=h.2jxsxqh)

[18. Changing internal color of an inserted shape (4 – Business Flow)](#_heading=h.z337ya)

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[20. Resizing an already inserted shape (4 – Business Flow)](#_heading=h.1y810tw)

[21. Cut Operation (4 – Business Flow)](#_heading=h.4i7ojhp)

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[24. Undo Operation (4 – Functional)](#_heading=h.3whwml4)

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[28. Zoom of the drawing window (5 – User Interface)](#_heading=h.1pxezwc)

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[31. Size of the grid (6 – Functional)](#_heading=h.147n2zr)

[32. Insert arbitrary polygon (7 – Functional)](#_heading=h.3o7alnk)

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[34. Size of the characters (8 – Business Flow)](#_heading=h.ihv636)

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[36. Mirror a shape (8 – Business Flow)](#_heading=h.1hmsyys)

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[47. Grid (6 – User Interface)](#_heading=h.fmedl4d26p8u)

[48. Paste menu (4 – User Interface)](#_heading=h.5y56ahkeesw8)

[D1. Fix the technical debt related to the possibility of obtaining a ShapeInterface object by clicking the drawing window](#_heading=h.nikunimgk533)

[D2. Fix the technical debt of the save feature implementation so that it has a scalable solution](#_heading=h.91m5yi155rtc)

[D3. Fix the technical debt of the load feature implementation so that it has a scalable solution](#_heading=h.kl2unbx0mdte)

[D4. Fix the technical debt related to the CloseContourShape and OpenContourShape classes](#_heading=h.7pzhpe6qeuld)

[D5. Fix the technical debt related to the managing of the input/output of the shapes](#_heading=h.waxf9zp0g8c7)

[B1. Fix the bug of the resizing of the window](#_heading=h.mvsybkuudojb)

[B2. Fix the bug related to the consecutive clicking the shape creation buttons](#_heading=h.1n5f05ffhbzs)

[B3. Void color](#_heading=h.ox27slimsot)

[B4. Focus over insertion](#_heading=h.pszvpqd4nd0s)

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User Story and Acceptance Criteria

We define 10 levels of **Priorities** from 1 as the *highest* to 10 as the *lowest*.

In the following paragraph we introduce a description of the requirements with:

**User Story** (a) and **Acceptance Criteria** (b).

All the Stories are written **As a User.**

*ID. Title (Priorities – Categories)*

### Multiples shapes together (1 – User Interface)

* 1. I want to add one or more geometrical shapes to the drawing window

so that I can make composed drawings.

* 1. If I’ve already added at least one figure to the drawing window

when I try to add another figure

then the new figure will be inserted together with the already inserted ones.

### Line segments (1 – Functional)

* 1. I want to be able to add line segments to the current drawing.
  2. I want the line segment shape to be shown in the menu of available shapes.

### Rectangles (1 – Functional)

* 1. I want to be able to add rectangles to the current drawing.
  2. I want the rectangle shape to be shown in the menu of available shapes.

### Ellipses (1 – Functional)

* 1. I want to be able to add ellipses to the current drawing.
  2. I want the ellipse shape to be shown in the menu of available shapes.

### Default window (1 – User Interface)

* 1. At the start of the program

I want to see an empty drawing window

in which I can add geometrical shapes.

### Menu of available shapes (1 – User Interface)

* 1. I want to see a menu of available shapes that I can use

so that I can easily choose a shape.

* 1. I want to be able to see a menu on the left side of the window containing all the shapes that can be added to the drawing window

so that I can select one of them by clicking on it.

### Position of new shapes (1 – Business Flow)

* 1. I want to be able to select, using the mouse on the window, the position of the new shape.
  2. If I’ve selected a shape from the menu of the available shapes

when I left click with the mouse on the drawing window

then I want that the selected shape is added in that position.

### Color picker for choosing the contour color (2 – User Interface)

1. I want to see a color picker for choosing the contour color of the next shape that will be added to the drawing window.
2. I want to see a color picker on the left side of the window

so that I can select the contour color of the next shape that will be added to the drawing window.

### Color picker for choosing the internal color (2 – User Interface)

1. I want to see a color picker for choosing the internal color of the next shape with a closed contour that will be added to the drawing window.
2. I want to see a color picker on the left side of the window

so that I can select the internal color of the next shape with a closed contour that will be added to the drawing window.

### Shapes with colored contour (2 – Functional)

1. I want to be able to add to the drawing window shapes with different contour colors.
2. Given that I’ve selected a shape from the menu of available shapes and I’ve selected a contour color from the relative color picker

when I add the selected shape in the drawing window

then I want that the contour of the added shape will be of the selected color.

### Colored shapes (2 – Functional)

1. I want to be able to add to the drawing window shapes with a closed contour characterized by different internal colors.
2. Given that I’ve selected a shape with a closed contour from the menu of available shapes and I’ve selected an internal color from the relative color picker

when I add the selected shape in the drawing window

then I want that the interior of the added shape will be of the selected color.

### Option bar on top of the window (2 – User Interface)

1. I want to be able to see the operations that can be performed on the drawing window.
2. I want to see an option bar on top of the window containing the operations that can be performed on the window

so that I can perform one of them by clicking on it.

### Save a drawing (2 – Business Flow)

1. I want to be able to save the drawing window

so that I can have a file in which is saved the current state of it.

1. When I left click on the save button in the option bar of the window

then a save window is opened.

### Load a drawing (2 – Business Flow)

1. I want to be able to load a drawing from a file

so that I can continue to work on an already started drawing.

1. Given that I have a file in which is saved a drawing

when I click on the load button in the option bar of the window

then a load window is opened and if a drawing file is selected, then the current content of the drawing window will be overwritten by the content of the file.

### Focus a shape (3 – Business Flow)

1. If there is at least one shape in the window,

I want to be able to give focus to one of them.

1. When I click on a shape in the list of inserted shapes

then that shape appears with a blue halo in the drawing window.

### Menu of available operations on a shape (3 – User Interface)

1. If there is at least one shape in the window,

I want to be able to see all the operations that can be performed on it.

1. Given that I’m a user

when I right click on an item in the list of inserted shapes

then I want to see a menu containing the operations that can be performed on it.

### Moving an already inserted shape (4 – Business Flow)

1. I want to be able to move a shape to a different position from the current one.
2. Given that I’ve previously selected a shape through a left click on the drawing window, giving focus to it,

then I want to be able to change the position of it by dragging the mouse on the drawing window.

### Changing internal color of an inserted shape (4 – Business Flow)

1. I want to be able to change the internal color of an already inserted shape.
2. Given that I’ve previously selected a shape with a closed contour, by giving focus to it,

then I want that the internal color of that shape is linked to the selected color of the relative color picker.

### Changing contour color of an inserted shape (4 – Business Flow)

1. I want to be able to change the contour color of an already inserted shape.
2. Given that I’ve previously selected a shape, by giving focus to it,

then I want that the contour color of that shape is linked to the selected color of the relative color picker.

### Resizing an already inserted shape (4 – Business Flow)

1. I want to be able to resize a shape already inserted in the drawing window.
2. When I open the menu of the available operations on a shape and I click on the resize button

then I want to be able to resize it by dragging the mouse on the drawing window.

### Cut Operation (4 – Business Flow)

1. I want to be able to perform a cut operation on an already inserted shape

so that i can remove the shape from the window and save it on the clipboard.

1. When I select the list of the available operations on a shape and I click on the cut button

then I want to be able to perform a cut operation on it, removing the shape from the drawing window and copying it to the clipboard.

### Copy Operation (4 – Business Flow)

1. I want to be able to perform a copy operation on an already inserted shape

so that I can copy the shape from the window and save it on the clipboard.

1. When I select the list of the available operations on a shape and I click on the copy button

then I want to be able to perform a copy operation on it, saving the shape on the clipboard.

### Paste Operation (4 – Business Flow)

1. I want to be able to perform a paste operation of a shape previously saved on the clipboard

so that I can add the shape into the drawing window.

1. Given that I’ve previously performed a cut or copy operation on a shape

when I left click on the drawing window

then I want that the shape previously saved on the clipboard is added to it.

### Undo Operation (4 – Functional)

1. I want to be able to perform the undo of every operations that change the state of the drawing, without limits on the number of undo levels

so that i can move back to a previous drawing state.

1. When I left click on the undo button in the option bar of the window

then I want the drawing to be taken back to its previous state.

### To the front operation (4 – Business Flow)

1. I want to be able to take an inserted shape in front of the others.
2. When I select the list of the available operations on a shape and I click on the to the front button

then I want the selected shape to be put in front of the others present in the drawing window.

### To the back operation (4 – Business Flow)

1. I want to be able to take an inserted shape in the back of the others.
2. When I select the list of the available operations on a shape and I click on the to the back button

then I want the selected shape to be put in back of the others present in the drawing window.

### List of inserted shapes (3 – User Interface)

1. I want to see a list of the shapes that has been inserted in the drawing window

so that I can easily have an overview and I can perform operations on them.

1. I want to be able to see a list on the right side of the window containing all the shapes that have been added to the drawing window

so that I can perform operations on one of them by clicking on it.

### Zoom of the drawing window (5 – User Interface)

* 1. I want to be able to zoom the drawing window with at least 8 different levels

so that I can view the drawn shapes bigger or smaller .

* 1. When I click on the zoom button

then I want the drawing to be enlarged or dwindled.

### Scrollable drawing surface (5 – User Interface)

* 1. I want a drawing surface that is larger than the size of the window

so that I have a bigger surface where I can draw.

* 1. When I scroll on the drawing

then I want to see the portion of the drawing that interests me.

### Show or hide grid (6 – User Interface)

* 1. I want an option for show/hide a grid on the drawing

so that I can place the shapes more precisely.

* 1. When I check the grid option

So I want to see a grid over the drawing or if it is already visible it gets hidden.

### Size of the grid (6 – Functional)

* 1. I want to be able to choose the size of the grid

so that I can adapt my drawing to real problems more easily.

* 1. In the menu bar there must be a Menu named View with a CheckMenuItem named Grid which, once activated, brings up an option in the left column to decide the size of the grid

### Insert arbitrary polygon (7 – Functional)

* 1. I want to be able to enter an arbitrary polygon, not just a regular one, as a shape.
  2. I want the polygon shape to be shown in the menu of available shapes.

### Insert text string (7 – Functional)

* 1. I want to be able to enter a text string as a shape.
  2. I want the text string “shape” to be shown in the menu of available shapes.

### Size of the characters (8 – Business Flow)

* 1. I want to be able to choose the size of the characters.
  2. When I want to add a text string shape through the button in the left column an option to choose the size must be displayed below the button.

### Rotate a shape (8 – Business Flow)

* 1. I want to be able to perform a rotate operation on an already inserted shape.
  2. When I select the list of the available operations on a shape and I click on the rotate button

then I want to be able to perform a rotate operation on it, rotating the shape by dragging the mouse on the drawing window.

### Mirror a shape (8 – Business Flow)

* 1. I want to be able to perform a mirror operation on an already inserted shape.
  2. When I select the list of the available operations on a shape and I click on the mirror button

then I want to be able to perform a mirror operation on it.

### Stretch a shape (8 – Business Flow)

* 1. I want to be able to perform a stretch operation on an already inserted shape.
  2. When I select the list of the available operations on a shape and I click on the stretch button

then I want to be able to perform a stretch operation on it, changing the height of it if I click on top or on bottom of it, otherwise changing the width.

### Group shapes (9 – Functional)

* 1. I want to be able to select more than one shape and group them

so that they behave as a single shape in successive operations.

### Ungroup shapes (9 – Functional)

* 1. I want to be able to ungroup a previously grouped shapes

so that they break down into basic shapes.

### Create a shape creation command (9 – Business Flow)

* 1. I need to be able to create “shape creation commands” by selecting a figure I can assign it a new command with a unique name.
  2. When I create a new shape creation command a copy of the shape's properties at that time is associated with it.

### Saving a shape creation command (9 – Business Flow)

* 1. I want that when I save the drawing the "shape creation commands" defined within it must be saved within the drawing file.

### Execute a shape creation command (9 – Functional)

* 1. I want to be able to execute a previously created shape creation command.
  2. When I execute a shape creation command a copy of the shape associated with it must be added to the drawing.

### Export a set of shape creation commands (10 – Functional)

* 1. I want to be able to export a set of previously created set of shape creation commands to a “shapes library file”.
  2. When I export a set of shape creation commands a new “shapes library file” will be created.

### Import a set of shape creation commands (10 – Functional)

* 1. I want to be able to import a set of shape creation commands from a “shapes library file”.
  2. When I import a set of shape creation commands these become executable in the drawing where I imported them.

### Selecting the size of a shape while drawing (1 – Business Flow)

1. I want to be able to select, using the mouse on the window, the size of the shape to be added.
2. If I’ve selected the position in which a new shape has to be added

when I drag the mouse in the drawing window

then I want to be able to size the shape.

### Defocus a shape (3 – Business Flow)

1. If there is a selected shape,  
   I want to be able to remove the focus from it.
2. Given that I’ve previously selected a shape, by giving focus to it,

when I left click on an empty section of the drawing window or I click on another shape in the drawing window or I click on an item of the list of inserted shapes related to a different inserted shape from the selected one

then I want the selected shape to lose focus.

### Grid (6 – User Interface)

* 1. I want to be able to view in the user interface a grid

so that I can place the shapes more precisely.

### Paste menu (4 – User Interface)

* 1. When a shape has been copied or cut and I right click on the drawing,  
     then I want a contextual menu to appear, so that I can paste that shape.

**Bug and Technical Debts** **Backlog**

### Fix the technical debt related to the possibility of obtaining a ShapeInterface object by clicking the drawing window

* Clicking on the drawing window it wasn’t possible to retrieve an object of the ShapeInterface interface, which was required for implementing the other actions like the MoveAction or the ResizeAction.

### Fix the technical debt of the save feature implementation so that it has a scalable solution

* The developed solution to save and load the content of the drawing window isn’t scalable.

### Fix the technical debt of the load feature implementation so that it has a scalable solution

* The developed solution to save and load the content of the drawing window isn’t scalable.

### Fix the technical debt related to the CloseContourShape and OpenContourShape classes

* The CloseCountoutShape and OpenContourShape classes have many methods equally implemented, so it’s required to develop a parent class

### Fix the technical debt related to the managing of the input/output of the shapes

* + The class FileIO required as parameter of the constructor an ObservableList<ShapeInterface>, which isn’t useful for the meaning of the class and led the instances of this one to be associated with a specific list of shapes.

### Fix the bug of the resizing of the window

* The drawing window and the left-side menu don’t resize with the resizing of the main window

### Fix the bug related to the consecutive clicking the shape creation buttons

* If consecutively different shapes are selected without drawing them, the buttons of the selected shapes remain focused.

### Void color

* After that a line has been selected and we try to draw a close contour shape, its internal color will be set to void.

### Focus over insertion

* If a shape in the drawing it’s being selected and the button to insert a new shape is pressed, then the previously selected shape doesn't lose focus.

### Focus saved on file

* If a shape in the drawing is selected and a Save is performed then the focus on that shape is saved together with the drawing.

### Undo after Load

* + Given that the user has performed some action and then he loads an already existing file, then the list of actions associated with the invoker isn’t cleared.

### Stretch after copying a rectangle

* + After performing a copy/cut and then paste operation, then the user isn’t able to perform a stretch operation on the pasted rectangle.