# Product Backlog

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ID** | **Title** | **Description** | **Acceptance Criteria** | **Priority** | **Story Points** |
| 1.1 | Empty window on start-up | As a user,  I want an empty window when I open the application,  So that I can start drawing from scratch | **AC1**:Given the application is properly installed,  When I launch it,  Then the application should start without any runtime errors or warnings.  **AC2:** Given the application is started,  When it loads,  Then a window should be visible to the user.  **AC3**: Given the application starts,  When the window appears,  Then the drawing area should be completely empty (no shapes, text, or UI artifacts).  **AC4**: Given the application window is open,  Then the title bar should display the correct name (e.g., "Drawing App" or similar). | High | 1 |
| 1.2 | Line drawing | As a user,  I want to be able to draw a line segment,  So that I can create drawings composed of this shape | **AC1**: Given that I have selected the "line" tool,  When I click on a first point in the drawing area,  Then the starting point of the line is recorded.  **AC2**: Given that a starting point has been selected,  When I click on a second point in the drawing area,  Then a straight line segment is drawn connecting the two points.  **AC3**: Given that the line has been drawn,  Then it becomes part of the drawing and remains visible. | High | 2 |
| 1.3 | Rectangle drawing | As a user,  I want to be able to draw a rectangle,  So that I can create drawings composed of this shape | **AC1**:Given that I have selected the "rectangle" tool,  When I click on a point in the drawing area,  Then that point is recorded as one corner of the rectangle.  **AC2**:Given that a first corner has been selected,  When I click on a second point in the drawing area,  Then a rectangle is drawn using the two points as opposite corners.  **AC3**: Given that the rectangle has been drawn,  Then it becomes part of the drawing and remains visible. | High | 2 |
| 1.4 | Ellipse drawing | As a user,  I want to be able to draw an ellipse,  So that I can create drawings composed of this shape | **AC1**: Given that I have selected the "ellipse" tool,  When I click a first point in the drawing area,  Then it is recorded as the first focus of the ellipse.  **AC2**: Given that the first focus is set,  When I click a second point,  Then it is recorded as the second focus of the ellipse.  **AC3**: Given that both foci have been set,  When I click a third point,  Then the ellipse is drawn such that the sum of the distances from this point to the two foci is the major axis length of the ellipse.  **AC4**: Given that the ellipse is drawn,  Then it becomes part of the drawing and remains visible. | High | 2 |
| 1.5 | Shape colour | As a user,  I want to choose a colour for the shape (from the following options: black, white, red, green, blue, yellow, teal, purple),  So that I can create drawings composed of coloured shapes | **AC1**: Given that I have selected a colour from the available options (black, white, red, green, blue, yellow, teal, purple),  When I draw a shape (line, rectangle, or ellipse),  Then the shape is rendered in the selected colour.  **AC2**:Given that no colour has been selected,  When I draw a shape,  Then a default colour (e.g., black) is used.  **AC3**: Given that I have selected a new colour,  When I draw additional shapes,  Then each new shape uses the newly selected colour. | Medium-High | 2 |
| 1.6 | Border colour | As a user,  I want to choose a border colour for the shape (from the following options: black, white, red, green, blue, yellow, teal, purple),  So that I can create drawings composed of coloured shapes | **AC1**:Given that I have selected a border colour from the available options (black, white, red, green, blue, yellow, teal, purple),  When I draw a shape (line, rectangle, or ellipse),  Then the border of the shape is rendered in the selected colour.  **AC2**: Given that no border colour has been explicitly selected,  When I draw a shape,  Then a default border colour (e.g., black) is applied.  **AC3**: Given that I change the border colour selection,  When I draw a new shape,  Then the new shape's border uses the newly selected colour. | Medium-High | 2 |
| 1.7 | Saving the drawing in a file | As a user,  I want to save a drawing into a file,  So that I can access it whenever I want | **AC1**: Given that I have created a drawing\*,  When I click the "Save" button,  Then the current drawing is saved as a file on my device.  **AC2**:Given that I save the drawing,  Then the file should have a meaningful default name (e.g., drawing\_001, or include timestamp).  **AC3**: Given that a drawing is saved,  Then the visual appearance of the file reflects exactly what was on the canvas at the moment of saving. | High | 8 |
| 1.8 | Opening a drawing via file | As a user,  I want to load a drawing from a file,  So that I can keep drawing on a previously saved canvas | **AC1**: Given that I have a valid drawing file saved on my device,  When I click the "Open file" button and select the file,  Then the drawing is loaded and displayed on the canvas.  **AC2**: Given that I load a drawing,  Then all the shapes (lines, rectangles, ellipses, colours, borders, etc.) appear as they were at the time of saving.  **AC3**:Given that I open a file of unsupported format or invalid content,  Then the application shows an appropriate error message and does not crash.  **AC4**: Given that I have unsaved work on the current canvas,  When I attempt to open a new file,  Then the application prompts me to save or discard current changes before loading the new drawing. | High | 8 |
| 2.1 | Shape of the drawing | As a user,  I want to select a shape of the drawing with a mouse operation,  So that I can freely edit it | **AC1**: Given that I have created one or more shapes on the canvas,  When I click on a shape with the mouse,  Then that shape becomes selected.  **AC2**: Given that I click outside any shape,  Then any currently selected shape becomes deselected. | High | 1 |
| 2.2 | Delete operation | As a user,  I want to be able to delete a shape of the drawing,  So that I can remove an element I no longer need | **AC1**: Given that I have created one or more shapes on the canvas and I have selected a shape,  When I click the "Delete" button,  Then the selected shape is removed from the canvas.  **AC2**: Given that no shape is selected,  When I click the "Delete" button,  Then nothing happens.  **AC3**:Given that I delete a shape,  Then the shape is permanently removed and no longer visible or editable. | High | 2 |
| 2.3 | Shape preview | As a user,  I want to see a shape preview I’m drawing.  So that I can place it precisely before finalizing it | **AC1**: Given that I have selected a shape tool (e.g., line, rectangle, ellipse),  When I click and start dragging the cursor on the canvas,  Then a preview of the shape appears and updates in real-time as I move the cursor.  **AC2**: Given that a shape preview is active,  Then it is rendered with a distinct visual style (e.g., dashed border, semi-transparent fill) to indicate that it is not final.  **AC3**: Given that I release the mouse button (or complete the drawing action),  Then the preview becomes a finalized shape, rendered normally on the canvas. | High | 3 |
| 2.4 | Move operation | As a user,  I want to be able to move a shape of the drawing,  So that I can freely adjust my drawing layout | **AC1**: Given that I have created one or more shapes on the canvas and I have selected a shape,  When I click and drag the shape with the mouse,  Then the shape follows the cursor and moves accordingly.  **AC2**: Given that I am dragging a shape,  When I release the mouse button,  Then the shape is placed at its final position on the canvas.  **AC3**: Given that no shape is selected,  When I click and drag on the canvas,  Then no shape is moved.  **AC4**: Given that I move a shape,  Then its visual style (e.g., colour, border) remains unchanged.  **AC5**: Given that I move a shape near the edge of the canvas,  Then the shape cannot be dragged outside the visible drawing area | High | 5 |
| 2.5 | Changing colour operation | As a user,  I want to be able to change the colour of a shape (or its border) of the drawing,  So that I can further customize its appearance | **AC1**:Given that I have created a shape and selected it,  When I click the "Change fill colour" button and choose a new colour,  Then the fill of the selected shape is updated with the new colour.  **AC2**:Given that I have selected a shape,  When I click the "Change border colour" button and choose a new colour,  Then the border of the selected shape is updated with the new colour.  **AC3**: Given that no shape is selected,  When I attempt to change a colour,  Then no change is applied and the application may show a message like “No shape selected”.  **AC4**: Given that I have selected a shape with an existing fill and/or border colour,  Then changing the colour updates only the selected property (fill or border), not both unless explicitly done.  **AC5**:Given that I change the colour of a shape,  Then the shape remains in the same position and retains its other properties | Medium-High | 2 |
| 2.6 | Changing size operation | As a user,  I want to be able to change the size of a shape of the drawing,  So that I can further customize its appearance | **AC1**: Given that I have created a shape and selected it,  When I click and drag one of its side or top/bottom or lateral handles,  Then the shape is resized freely according to the direction of the drag.  **AC2**: Given that I have selected a shape,  When I click and drag from one of its corner handles,  Then the shape is resized while maintaining its original proportions (aspect ratio is locked).  **AC3**: Given that a shape is selected,  Then resize handles are visible and enabled around the shape.  **AC4**: Given that I resize a shape,  Then all other properties of the shape (e.g., fill colour, border, type) remain unchanged.  **AC5**: Given that I resize a shape,  Then the resizing should be visible in real time as I drag.  **AC6**: Given that no shape is selected,  When I attempt to resize,  Then no resizing occurs. | Medium-High | 8 |
| 2.7 | Cut operation | As a user,  I want to be able to cut a shape of the drawing,  So that I can paste it elsewhere whenever I want | **AC1**: Given that I have created a shape and selected it,  When I click the "Cut" button,  Then the selected shape is removed from the canvas and stored in the clipboard.  **AC2**: Given that a shape has been cut,  Then it can be pasted elsewhere using the "Paste" operation.  **AC3**: Given that no shape is selected,  When I click the "Cut" button,  Then nothing happens and no content is added to the clipboard.  **AC4**: Given that I cut a shape,  Then all its properties (e.g., size, position, fill colour, border) are preserved in the clipboard for later use. | High | 2 |
| 2.8 | Copy operation | As a user,  I want to be able to copy a shape of the drawing,  So that I can paste it elsewhere whenever I want | **AC1**: Given that I have created a shape and selected it,  When I click the "Copy" button,  Then a copy of the selected shape is added to the clipboard without removing it from the canvas.  **AC2**: Given that a shape has been copied,  Then I can paste it onto the canvas using the "Paste" operation.  **AC3**: Given that no shape is selected,  When I click the "Copy" button,  Then nothing happens and the clipboard remains unchanged.  **AC4**: Given that I copy a shape,  Then all properties of the shape (e.g., size, position, fill colour, border) are preserved in the clipboard.  **AC5**: Given that I copy a shape,  Then the original shape remains fully intact and unmodified on the canvas.  **AC6**: Given that multiple shapes are selected (if multi-selection is supported),  When I click "Copy",  Then all selected shapes are copied together to the clipboard. | High | 2 |
| 2.9 | Paste operation | As a user,  I want to be able to paste a shape into the drawing,  So that I can reuse shapes within the drawing | **AC1**: Given that a shape has been previously cut or copied to the clipboard,  When I click the "Paste" button,  Then a copy of the shape is added to the canvas.  **AC2**: Given that I paste a shape,  Then it should appear in a default position (e.g., centered or slightly offset from the original if pasted multiple times).  **AC3**: Given that the shape was copied,  Then the original remains on the canvas, and the pasted shape is an identical duplicate.  **AC4**: Given that the shape was cut,  Then the pasted shape represents the moved object and retains all its original properties.  **AC5**: Given that there is no shape in the clipboard,  When I click "Paste",  Then nothing happens, or an appropriate message is displayed (e.g., "Clipboard is empty").  **AC6**: Given that I paste a shape,  Then all its properties (e.g., size, fill colour, border colour, type) are preserved in the new instance.  **AC7**: Given that multiple shapes were copied or cut,  When I click "Paste",  Then all shapes are pasted together, maintaining their relative positions.  **AC8**: Given that I paste a shape,  Then I should be able to move, edit, or delete it like any other shape. | High | 2 |
| 2.10 | Undo operation | As a user,  I want to be able to undo an operation with no limit,  So that I can restore the canvas to any previous state | **AC1**: Given that I have performed at least one operation,  When I click the "Undo" button,  Then the last operation is reverted, and the canvas is updated to reflect the previous state.  **AC2**: Given that I have performed multiple operations,  When I click "Undo" repeatedly,  Then each previous state is restored step-by-step, with no limit on the number of undo levels.  **AC3**: Given that I have not performed any operation,  When I click "Undo",  Then nothing happens, and the canvas remains unchanged.  **AC4**: Given that I undo an operation,  Then all properties affected by that operation (e.g., position, size, colour, presence on canvas) are accurately restored.  **AC5**: Given that I undo a cut, delete, or move operation,  Then the affected shape is returned to its original state and position on the canvas.  **AC6**: Given that I undo a draw operation,  Then the shape that was added is removed. | High | 8 |
| 2.11 | Bring to the front | As a user,  I want to be able to bring a shape to the front,  So that I can make an old shape more visible than newer ones | **AC1**: Given that there are multiple overlapping shapes on the canvas and one is selected,  When I click the "Bring to the Front" button,  Then the selected shape is moved above all other shapes, making it fully visible.  **AC2**: Given that no shape is selected,  When I click the "Bring to the Front" button,  Then nothing happens.  **AC3**: Given that the selected shape is already in the foreground,  When I click "Bring to the Front",  Then its position remains unchanged.  **AC4**: Given that I bring a shape to the front,  Then its position on the canvas (X/Y coordinates) remains unchanged — only its z-order is updated.  **AC5**: Given that I undo the operation,  Then the shape returns to its previous layering order.  **AC6**: Given that multiple shapes are selected (if supported),  When I click "Bring to the Front",  Then all selected shapes are brought to the top, preserving their relative stacking order. | Medium-High | 2 |
| 2.12 | Send to the back | As a user,  I want to be able to send a shape to the back,  So that I can make a new shape less visible than old ones | **AC1**: Given that there are multiple overlapping shapes on the canvas and one is selected,  When I click the "Send to the Back" button,  Then the selected shape is moved behind all other shapes, placing it at the bottom of the stacking order.  **AC2**: Given that no shape is selected,  When I click the "Send to the Back" button,  Then nothing happens.  **AC3**: Given that the selected shape is already at the back,  When I click "Send to the Back",  Then its position remains unchanged.  **AC4**: Given that I send a shape to the back,  Then its position on the canvas (X/Y coordinates) remains unchanged — only its z-order is updated.  **AC5**: Given that I undo the operation,  Then the shape returns to its previous layering order.  **AC6**: Given that multiple shapes are selected (if supported),  When I click "Send to the Back",  Then all selected shapes are sent to the back together, preserving their relative stacking order. | Medium-High | 2 |
| 3.1 | Zoom levels | As a user,  I want to be able to zoom in and out of the canvas,  So that I can better view specific part of the canvas | **AC1**: Given that the drawing area is displayed,  When the user selects a different zoom level (e.g., via a slider, buttons, or dropdown),  Then the entire drawing content scales up or down accordingly.  **AC2**: Given that zooming occurs,  Then the shapes and canvas content maintain their proportions and aspect ratio (no distortion).  **AC3**: Given that the user zooms in,  Then details become larger and easier to see, while the canvas area may become scrollable.  **AC4**: Given that the user zooms out,  Then the content becomes smaller, showing a larger portion of the drawing area.  **AC5**: Given that a zoom level is applied,  Then the position of shapes relative to each other remains unchanged.  **AC6**: Given that the zoom level reaches minimum or maximum limits,  Then further zooming in or out is disabled or prevented.  **AC7**: Given that the user zooms,  Then the zoom level control UI updates to reflect the current zoom percentage or factor. | Medium | 3 |
| 3.2 | Multiple predefined zoom levels | As a user,  I want at least 4 different levels of zooming,  So that I can easily zoom in and out of the canvas. | **AC1**: Given that the zoom control is available,  When the user selects one of the predefined zoom levels (at least 4 levels, e.g., 50%, 100%, 150%, 200%),  Then the drawing area adjusts to the selected zoom level.  **AC2**: Given that the user selects a predefined zoom level,  Then the drawing content scales proportionally without distortion.  **AC3**: Given that a zoom level is selected,  Then the zoom control visibly indicates the current zoom level.  **AC4**: Given that the user changes zoom levels repeatedly,  Then the zoom transitions smoothly and accurately to the selected level.  **AC5**: Given that the user selects the same zoom level currently active,  Then no unnecessary redraw or scaling occurs.  **AC6**: Given that the user selects a zoom level outside the predefined options,  Then the selection is either disallowed or snapped to the nearest available level. | Medium | 3 |
| 3.4 | Scrollable Canvas | As a user,  I want to scroll the drawing area when it's larger than the window,  So that I can access hidden areas of the drawing | Given that the drawing area exceeds the visible window size,  When the user scrolls horizontally or vertically,  Then the viewport moves accordingly, revealing different parts of the drawing | Medium | 3 |
| 3.5 | Grid on / Grid off | As a user,  I want to turn the background grid on or off,  So that I can chose whether to use it or hide it | Given a grid overlay is available,  When the user toggles the grid option,  Then the grid is shown or hidden accordingly | Medium | 2 |
| 3.6 | Adjustable  Grid Size | As a user,  I want to choose the spacing of the grid lines,  So that I can easily change size | Given the grid is visible,  When the user adjusts the grid spacing setting,  Then the grid updates to reflect the new spacing | Medium | 3 |
| 4.1 | Drawing an irregular polygon | As a user,  I want to draw a polygon that isn’t regular,  So that I’m not limited by default shapes | Given that I have clicked the “polygon” button  When I click the mouse in the drawing area  Then a polygon is created with the position corresponding to my cursor | Medium | 8 |
| 4.2 | Text as shape | As a user,  I want to write a text as a shape,  So that I can further customize the drawing using elements that aren’t shapes | Given that I have clicked the “text” button,  When I click the mouse in the drawing area,  Then a text area is created with the position corresponding to my cursor | Medium | 3 |
| 4.3 | Rotate a shape | As a user,  I want to rotate a shape of the drawing,  So that I can easily edit it | Given that I have selected an already drawn shape,  When I click the “rotate” button,  Then the shape will be rotated | Medium | 2 |
| 4.4 | Mirror a shape | As a user,  I want to mirror a shape of the drawing, both vertically and horizontally,  So that I can easily edit it | Given that I have selected an already drawn shape,  When I click the “mirror” button,  Then the shape will be mirrored | Medium | 2 |
| 4.5 | Stretch a shape | As a user,  I want to stretch a shape of the drawing, both vertically and horizontally,  So that I can easily edit it | Given that I have selected and already drawn shape,  When I drag a shape border,  Then the shape will be stretched according to the position of the drag | Medium | 3 |
| 5.1 | Group shape | As a user,  I want to group two or more shapes in one,  So that I can edit them at the same time | Given that I select more than one shape,  When I click on the “group” button,  Then a custom shape will be created | Medium-Low | 5 |
| 5.2 | Ungroup shape | As a user,  I want to ungroup a grouped shape,  So that I can edit each shape separately | Given that I select a custom shape,  When I click on the “ungroup” button,  Then a custom shape will be separated in simple shapes | Medium-Low | 3 |
| 5.3 | Saving a group of shapes | As a user,  I want to save grouped shapes as a custom shape,  So that I can immediately use that custom shape | Given that I have selected a grouped shape,  When I click the “save custom shape” button,  Then the custom shape will be saved and ready to use | Low | 8 |
| 5.4 | Use grouped shapes | As a user,  I want to use a custom shape previously saved,  So that I don’t have to re-create the custom shape | Given that I have selected a saved custom shape,  When I click on the drawing area,  Then the custom shape will be drawn into the canvas | Low | 3 |
| 5.5 | Save custom shape after the saving of the file | As a user,  I want to save the drawing file, including any custom shape,  So that I don’t need to re-create the shape when I open the saved file | Given that I have drawn a custom shape,  When I click on the “save file” button,  Then the custom shapes will be saved alongside the file | Medium-Low | 8 |
| 5.6 | Export custom shape in a library | As a user,  I want to export custom shapes to a library file,  So that I can import all custom shapes whenever I want | Given that I have already saved custom shapes into the application,  When I click on the “export to library” button,  Then a new file containing custom shapes will be saved | Low | 8 |
| 5.7 | Import custom shape from a library | As a user,  I want to import custom shapes from a library file,  So that I can use all custom shapes I have previously created | Given that I have got an external library file,  When I click on the “import from library”,  Then the custom shapes from the file will be available | Low | 8 |