1. Objectives

- Refactor the display mode to ensure consistent and user-friendly behavior.
- Address remaining issues in zoom functionality and scrollbar integration for image navigation.
- Enhance the status bar to dynamically display image dimensions during various operations.
- Improve rotation logic for accurate dimension updates and vector resizing.

---

2. Activities

- **Display Mode Refinement:**
    - Changed display mode logic to focus on "Fit to View" behavior:
        - Refactored ImageProcessor::loadImage to center the image using a translation matrix without relying on fitInView.
        - Updated updateDisplayImage to use an identity matrix for original size display and to update the texture correctly.
        - Added scrollbars in GraphicsView for navigation when the image overflows:
            - Introduced setImageItem in GraphicsView to assign the image item.
            - Updated updateViewMatrix to calculate scroll offsets and manage scrollbar visibility.
            - Added null checks for m_imageItem to prevent errors in updateViewMatrix and drawScrollbars.
        - Issues:
            - Persistent errors with m_imageItem as an undeclared identifier due to missing initialization.

        - Scrollbars were not fully functional due to incomplete integration of the TextureItem class.
        - Image centering logic failed on window resizing.
    - Reverted to the original "Fit to View" mode by restoring changes in GraphicsView::fitInView.

- **Zoom Functionality Updates:**
    - Reapplied the zoom functionality from the previous implementation:
        - Fixed UI zoom interactions, ensuring smooth operation.
        - Resolved issues preventing proper zoom scaling and display updates.

- **Status Bar Enhancements:**
    - Updated the status bar to display:
        - Original and fitted sizes after loading an image.
        - Original and processed dimensions during processCurrentImage.
        - Cropped dimensions based on fitted dimensions.
        - Dimensions before and after rotation, including swapped values for clockwise and counterclockwise rotations.
    - Dynamically updated the status bar to reflect real-time changes during operations:
        - Added logic in loadImage and processCurrentImage for accurate updates.
        - Ensured the status bar reflected accurate dimensions during cropping and rotation.

- **Rotation Logic Improvements:**
    - Refined clockwise and counterclockwise rotation:
        - Added logic to handle dimension swapping during rotation.
        - Updated processCurrentImage to ensure accurate image data updates.

        - Adjusted vector resizing to align with rotated dimensions.
    - Ensured dimension changes were reflected accurately in the status bar.

---

3. Achievements

- Restored and stabilized "Fit to View" display mode as the default behavior for consistent usability.
- Fixed zoom functionality, ensuring smooth and accurate scaling via the UI.
- Enhanced the status bar to provide real-time feedback on image dimensions during all operations.
- Improved rotation logic, ensuring accurate updates to image dimensions and proper vector resizing.

---

4. Problems & Solutions

1. **Problem:** Persistent errors with m_imageItem due to missing initialization.
    - **Solution:** Added null checks and debugging output for m_imageItem initialization; further integration of TextureItem class is required.
2. **Problem:** Scrollbars not fully functional for navigation in "Original Size" mode.
    - **Solution:** Reverted to "Fit to View" display mode for stability; scrollbar integration will be revisited in future updates.
3. **Problem:** Image centering failed after window resizing.
    - **Solution:** Documented required adjustments for centering logic; addressed temporary stability by reverting changes.
4. **Problem:** Status bar lacked real-time dimension updates.
    - **Solution:** Integrated logic to dynamically update status bar dimensions during all major operations.
5. **Problem:** Rotation logic caused inconsistent dimension updates.

- **Solution:** Refined rotation logic to handle dimension swapping and ensure accurate updates in both status bar and internal data.