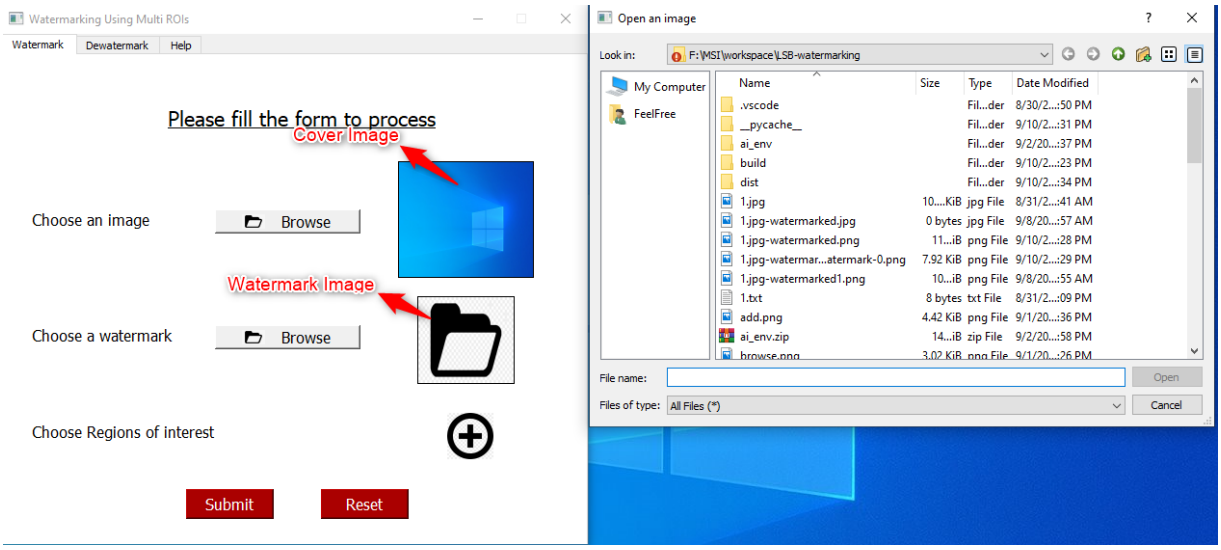
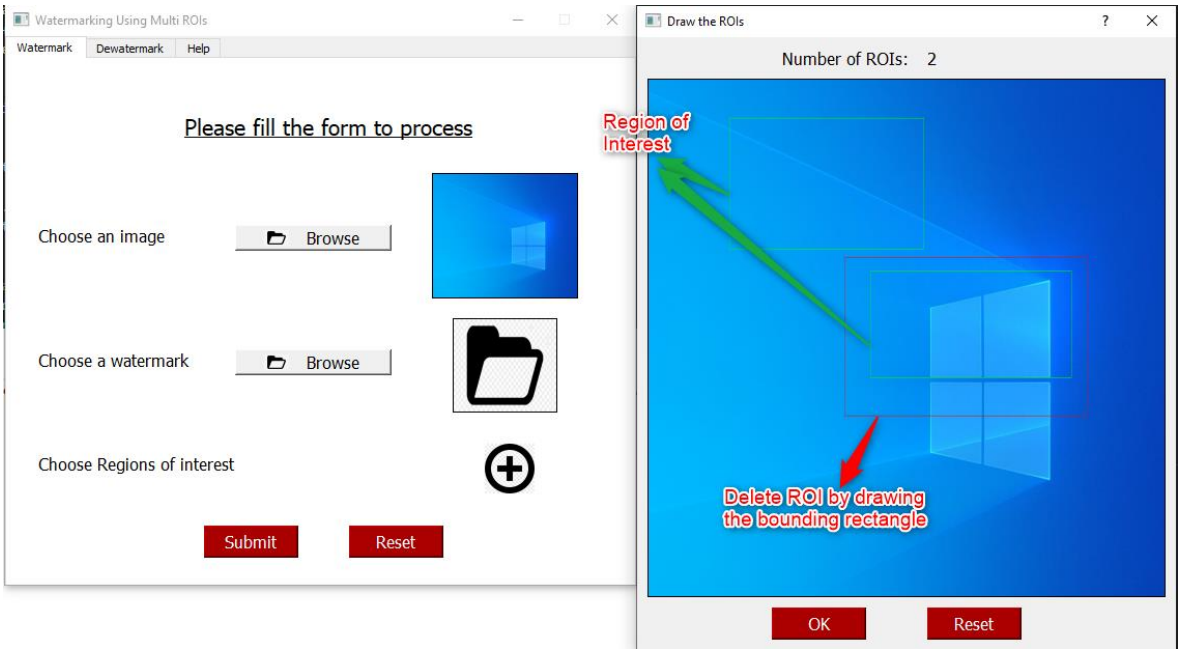
1. Watermarking
   - User can choose the images from File Explorer by clicking “Browse” button, then display the images in the image area for Cover Image and Watermark Image



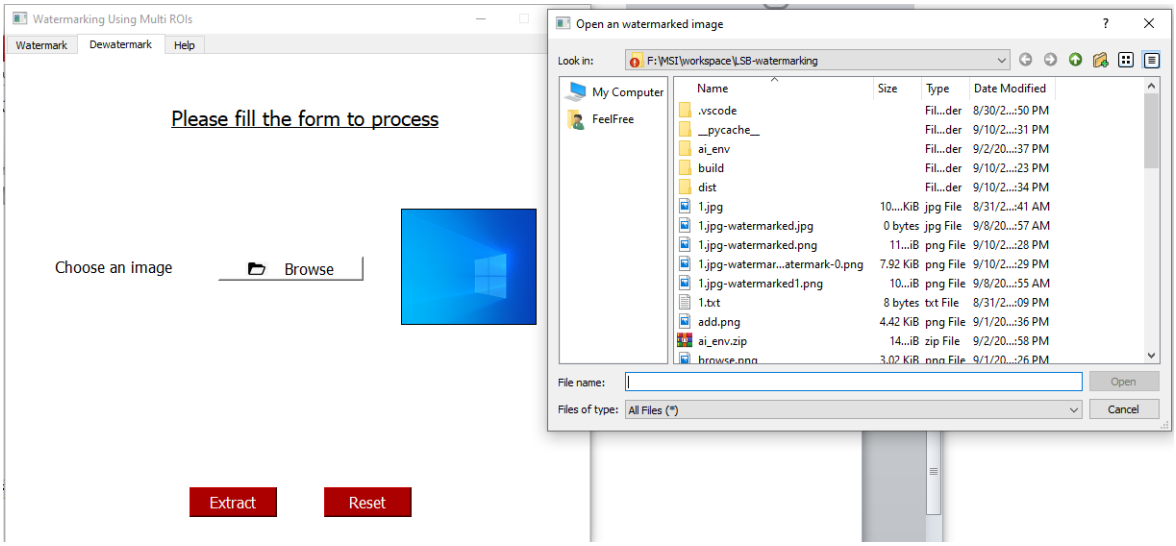
   - User can choose the ROIs by drawing the rectangles on Cover Image.



     If user draws the rectangle with left mouse clicking, a new ROI is added.
     If user draws the rectangle with right mouse clicking, a ROI which is bounded is removed from the ROIs.
     ROIs can’t be intersect with each other. If new rectangle is intersect with any existing ROI, it will be ignored.
     If user clicks “Reset” button on ROI dialog, delete all ROIs.

- If user clicks “Submit” button, the app does “watermarking”.
  If the ROI ‘s size is smaller than watermark, it can’t embed the watermark in that ROI, so the app ignores this invalid ROI from the ROIs.
  The suffix of watermarked image is “-watermarked.png”, so if the cover image is “cover.png”, the name of watermarked image will be “cover.png-watermarked.png”.
- If user clicks “Reset” button on main window, remove all of form.

2. Dewatermarking
   - User choose the watermarked image from “Browse” button.



   - If user clicks “Extract” button, app extracts the watermark images.
     The suffix of extracted watermark image is “-##.png”, like “-0.png”, “-1.png”.

3. Appendix
   - Watermarking Algorithm
     Input : Cover Image, Watermark Image, ROIs
     Output : Watermarked Image
     1. Make the header

Field	Description	Byte number
FSize	The size of watermark image	4
ROIs_Number	The number of ROIs	2
ROI_Bytes	The information of ROIs Each ROI has 4 elements(x, y, w, h)	2 * 4 * ROIs_Number

     2. Write the header on cover image from first pixel using LSB.
     3. Write the watermark image on ROI using LSB
        Watermark image is embedded in binary format and located on each ROI’s area.
   - Dewatermarking.

This algorithm is the reverse of Watermarking, read the header from watermarked image and extracts the watermark image.

- Required packages
  Pyqt5, Pillow