



MINI PROJECT REPORT

IMAGE RESIZER

UE20CS352– OOAD WITH JAVA

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PROBLEM STATEMENT

Image Resizer is a Java-based tool that allows you to resize images in bulk, with minimal effort. With Image Resizer, you can quickly reduce the size of your images, making them easier to manage and store.

FEATURES:

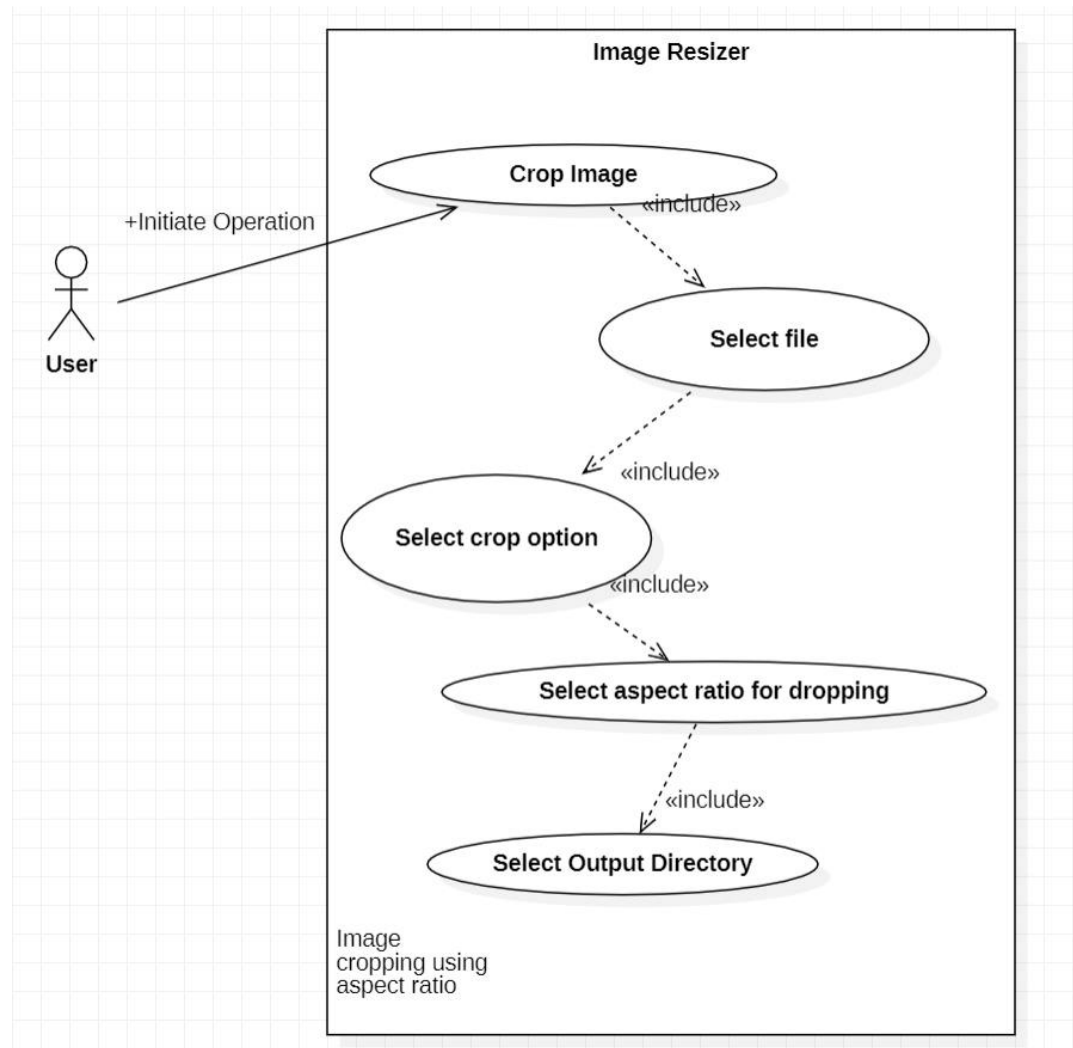
- This tool allows the users to resize multiple images at once.
- It provides an efficient and customizable way to reduce the size of images for various purposes, such as web optimization or storage management.
- The tool supports various image formats, including JPEG and PNG.
- It also provides the user with a user-friendly UI that would make the tool much easier to use for a layman.
- Users can specify the output size of the images using custom dimensions or percentage values.
- The tool also supports batch processing of multiple images, allowing users to resize large numbers of images with just a few clicks.
- Additionally, users can specify the quality level of the output images.

The Image Resizer is a useful tool for anyone who needs to manage and optimize large numbers of images quickly and efficiently.

MODELS

USE CASE DIAGRAM:

IMAGE CROPPING USING ASPECT RATIO



Name: Image cropping using aspect Ratio

Actor: Software user

Summary / Overview: Crops the image selected by the user according to the aspect ratio specified by him/her.

Pre-condition : None.

Description :

- The user will the crop image option.
- User will select the file to be cropped.
- User will enter the required aspect ratio.
- The image is cropped accordingly.

e. User selects the directory for the output image to be stored.

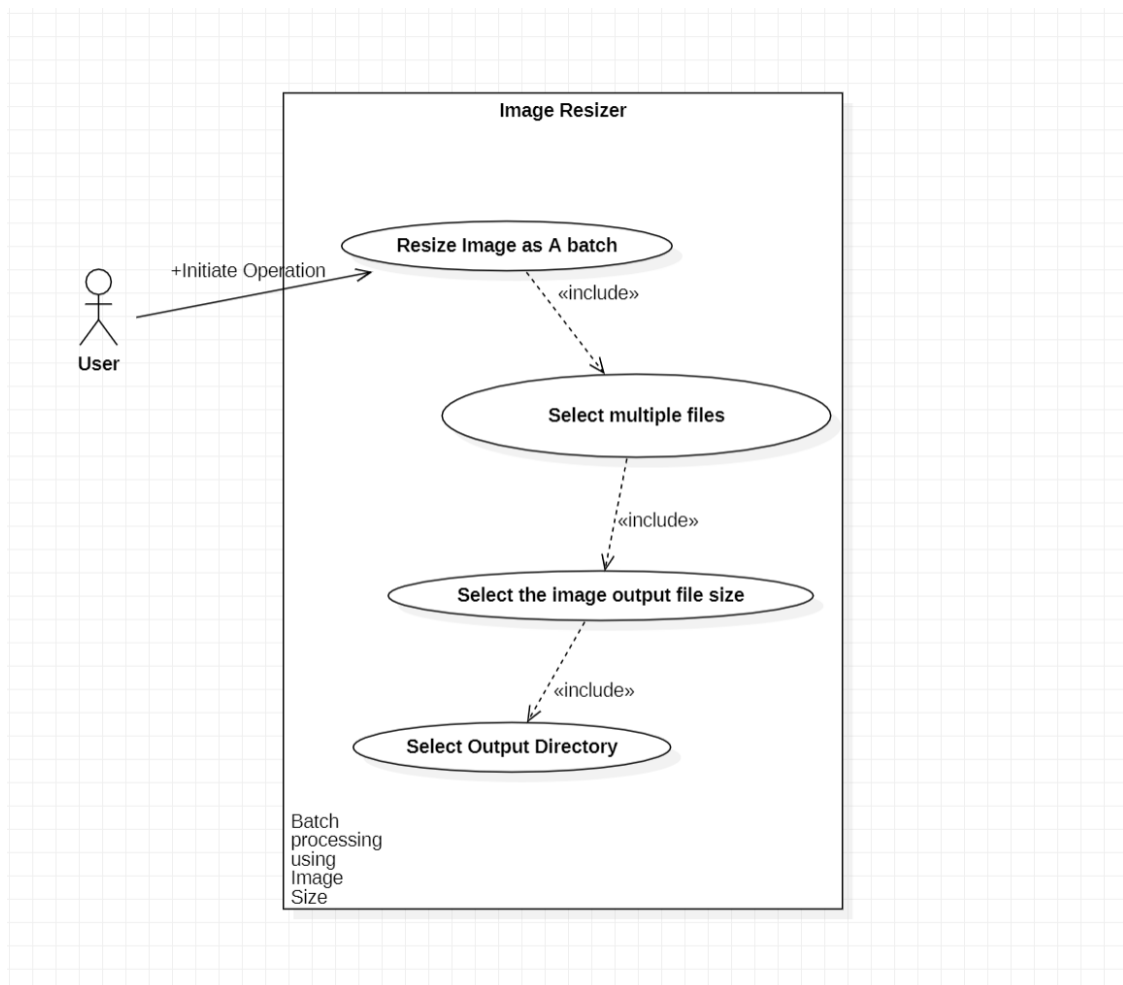
Exceptions :

- a. Image file format not supported.
- b. Output file directory may be restricted.

Alternate Flows : None

Post Conditions : None

IMAGE RESIZER USING BATCH PROCESSING AND FILE SIZE



Name : Image resizer using batch processing and file size

Actor: Software user

Summary / overview : this functionality allows the user to resize the image using batch processing.

Pre-condition : none

Description :

A. User selects resize image as a batch option.

- B. Then multiple files to be resized are selected.
- C. The user selects the images output size.
- D. User then selects the directory in which the processed images need to be stored.

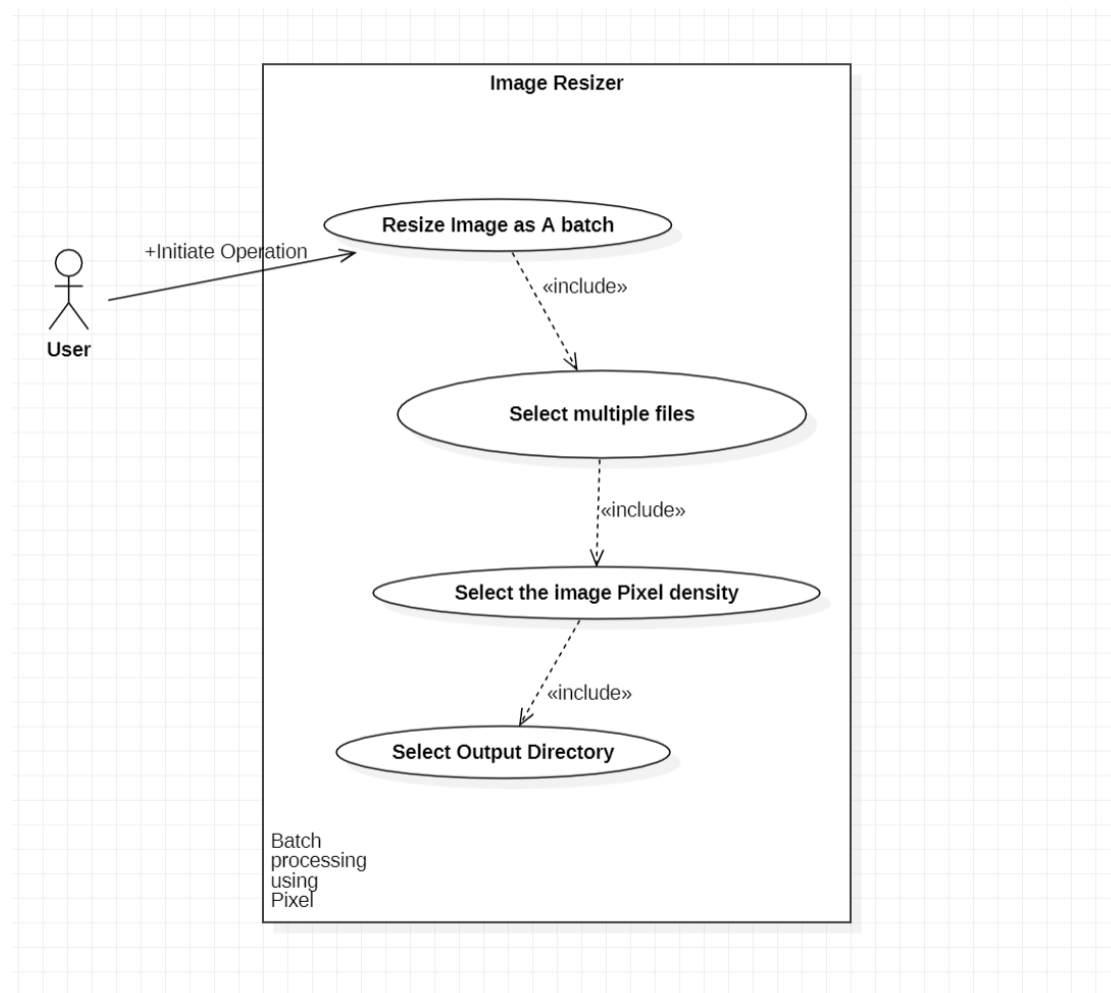
Exceptions :

- A. Image file format not supported.
- B. Output file directory may be restricted.

Alternate flows : none

Post conditions : image after processing is stored in aforementioned director

IMAGE RESIZING AS BATCH PROCESSING USING PIXEL DENSITY



Name : Image Resizer using Batch processing and Pixel density

Actor: Software user

Summary / Overview : This functionality allows the user to resize multiple images by specifying pixel density.

Pre-condition : None

Description :

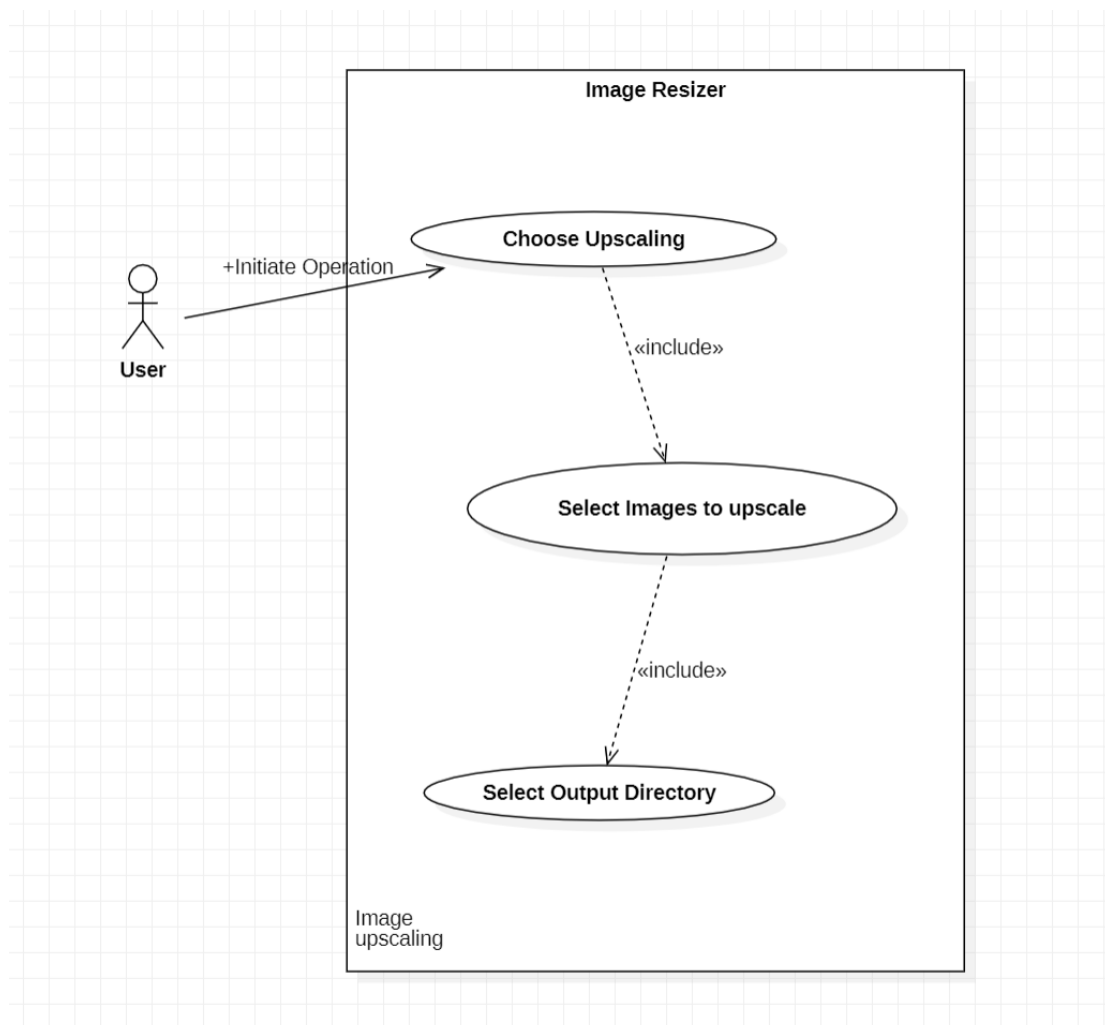
- a. User selects resize image as single image option.
- b. Then image to be resized is selected.
- c. The user selects the images output size.
- d. User then selects the directory in which the processed images need to be stored.

Exceptions :

- a. Image file format not supported.
- b. Output file directory may be restricted.

Alternate Flows : None

Post Conditions : Image after processing is stored in aforementioned directory

IMAGE UPSCALING

Name : Image Upscaling

Actor: Software user

Summary / overview : This functionality allows the user to upscale the image.

Pre-condition : none

Description :

- A. User selects upscale image option.
- B. Then file to be upscaled is selected.
- C. User then selects the directory in which the processed images need to be stored.

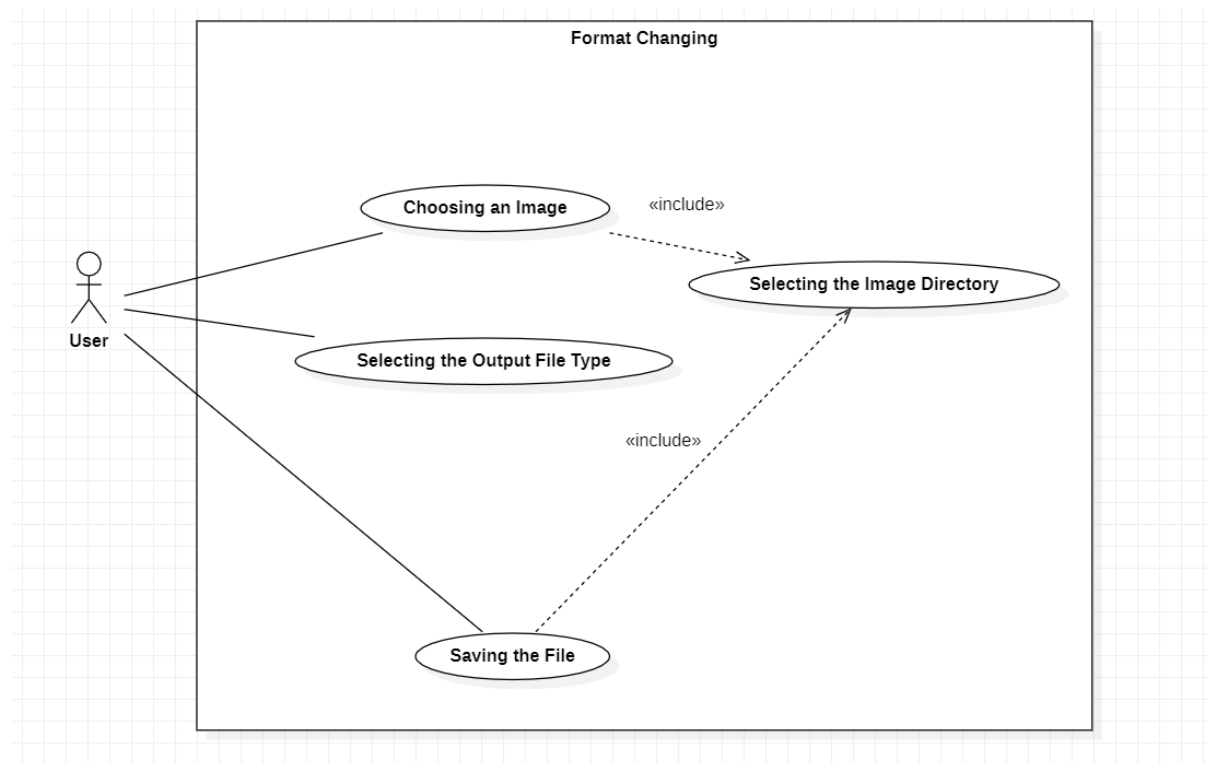
Exceptions :

- A. Image file format not supported.
- B. Output file directory may be restricted.

Alternate flows : none

Post conditions : image after processing is stored in aforementioned directory.

FORMAT CHANGING



Name : Image resizer using batch processing and pixel density

Actor: Software user

Summary / overview : This functionality allows the user to resize multiple images by specifying pixel density.

Pre-condition : none

Description :

- A. User selects resize image as single image option.
- B. Then image to be resized is selected.
- C. The user selects the images output size.
- D. User then selects the directory in which the processed images need to be stored.

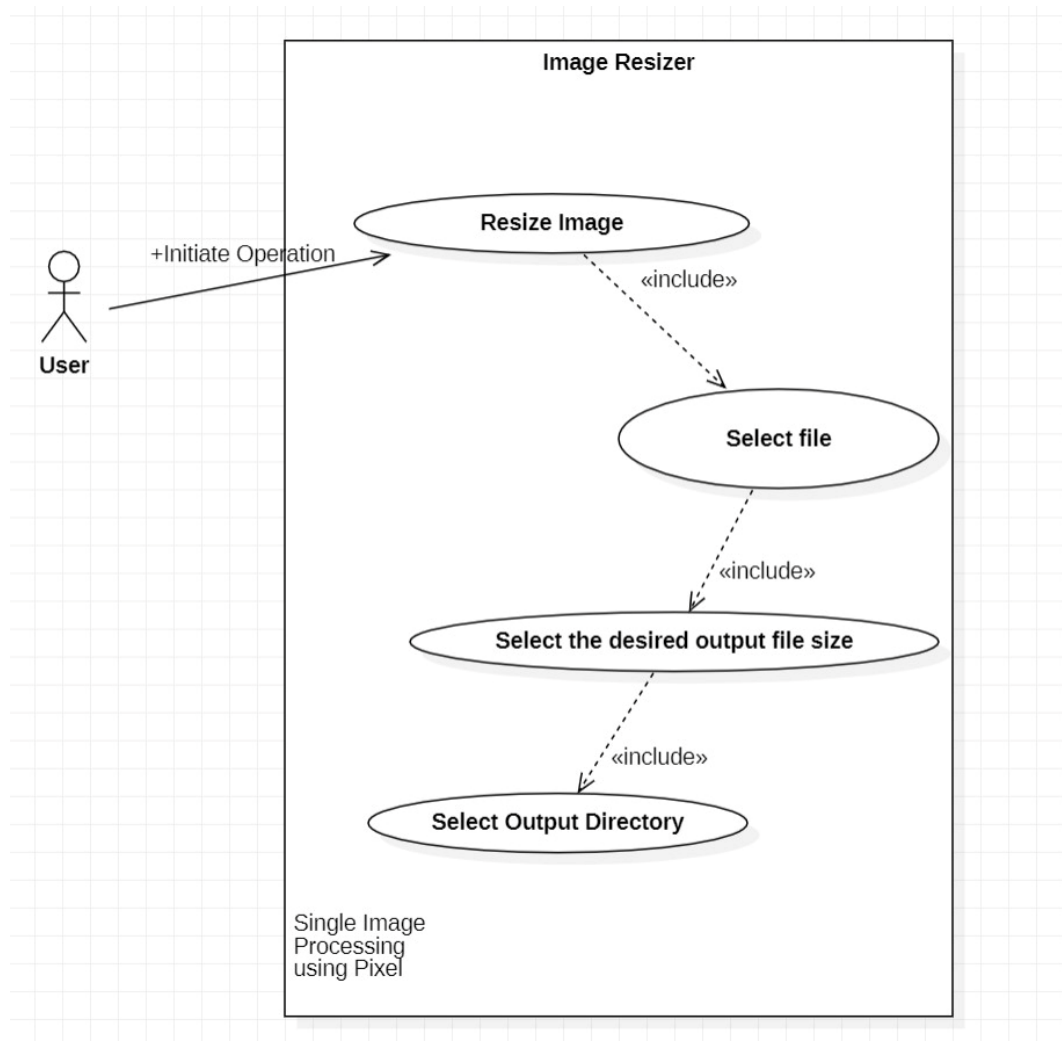
Exceptions :

- A. Image file format not supported.
- B. Output file directory may be restricted.

Alternate flows : none

Post conditions : image after processing is stored in aforementioned directory

IMAGE RESIZER USING PIXEL DENSITY



Name : Image resizer using pixel density

Actor: software user

Summary / overview : this functionality allows the user to resize the image by specifying the pixel density.

Pre-condition : none

Description :

- A. User selects resize image as single image option.
- B. Then image to be resized is selected.
- C. The user selects the images output size as pixel.
- D. User then selects the directory in which the processed images need to be stored.

Exceptions :

- A. Image file format not supported.
- B. Output file directory may be restricted.

Alternate flows : none

Post conditions : image after processing is stored in aforementioned directory

CLASS DIAGRAM:

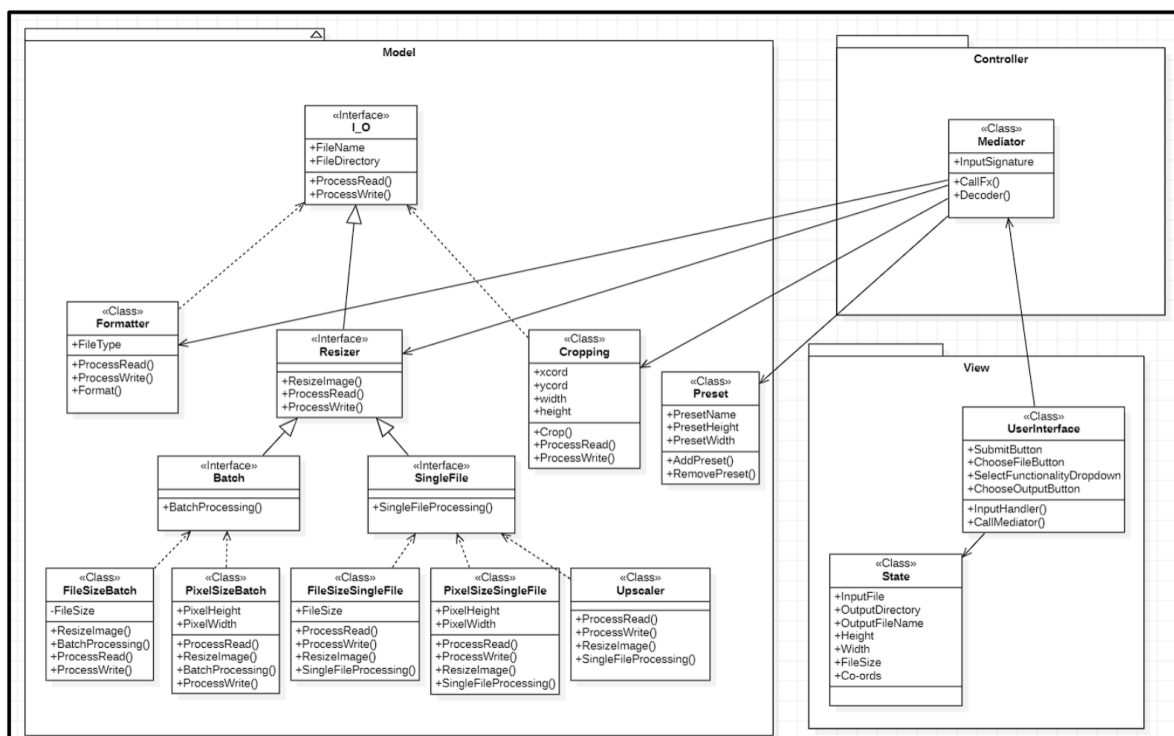


Fig: Class Diagram of Image Resizer Tool

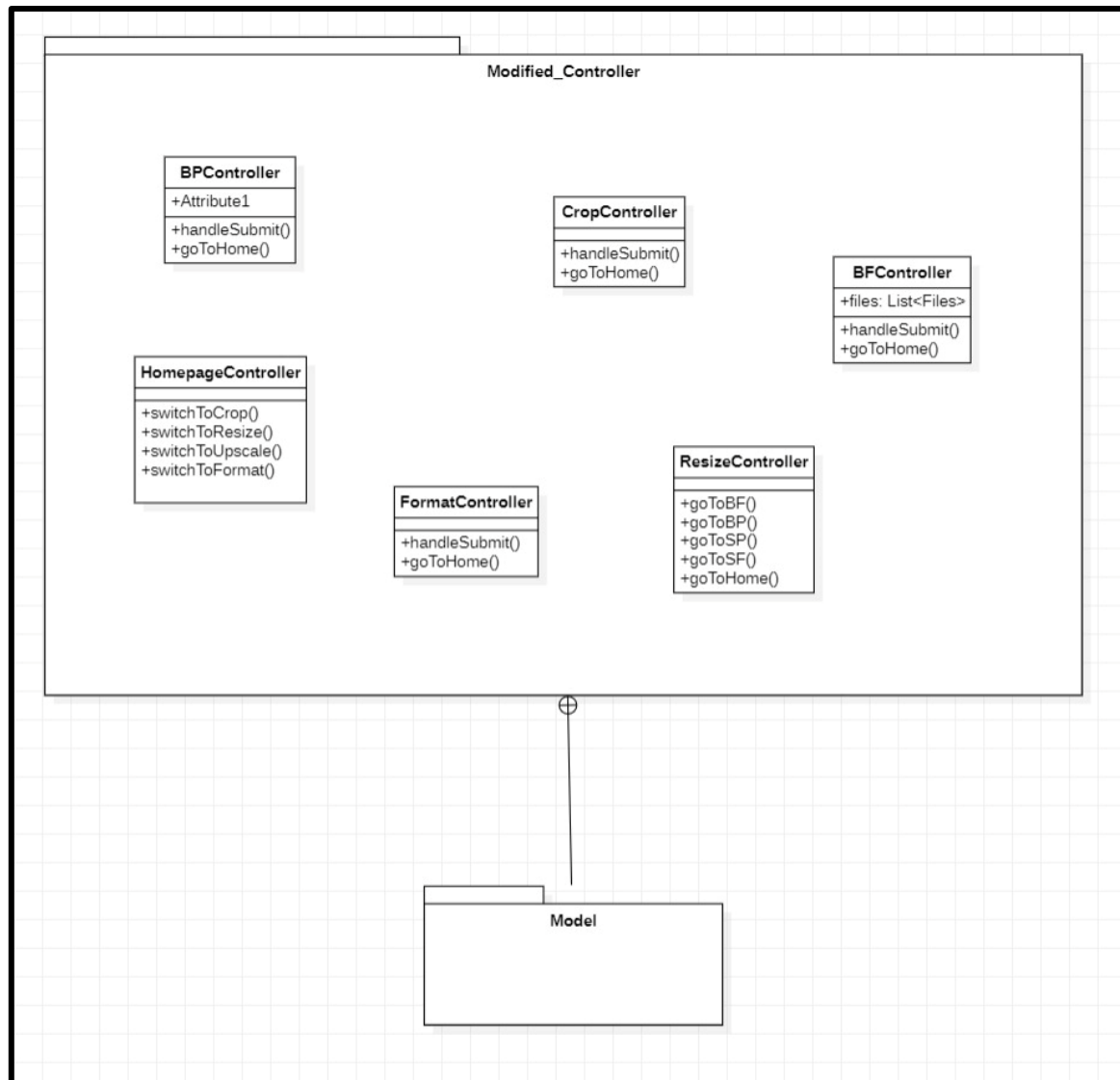


Fig: Reimagined class diagram of the controller as per implementation

ARCHITECTURAL PATTERN

For this project, we have employed the MVC architectural pattern.

VIEW:

- 1.) **User Interface:** It follows Indirection principle as it doesn't directly communicate with classes of Model rather uses Mediator for communication.
- 2.) **State:** It follows Information Expert principle because it stores all the information.

CONTROLLER:

- 1.) **Mediator:** It follows Controller principle because it mediates control between all the model elements.
- 2.) **Single Responsibility Principle:** Each of the controller acts as a mediator only between the

MODEL:

- 1.) **Resizer<interface>:** It follows Interface Segregation principle, Open Close principle and Polymorphism
- 2.) **Formatter:** It follows Single Responsibility principle
- 3.) **Cropping:** It follows Single Responsibility principle
- 4.) **FileSizeBatch:** It follows Single Responsibility principle and Dependency Inversion
- 5.) **PixelSizeBatch:** It follows Single Responsibility principle and Dependency Inversion
- 6.) **FileSizeSingleFile:** It follows Single Responsibility principle
- 7.) **PixelSizeSingleFile:** It follows Single Responsibility principle
- 8.) **Upscaler:** It follows Single Responsibility principle

DESIGN PATTERN

Creation Design Pattern:

Builder pattern: All the controllers build the object from another class by running generating an instance of that class, the builder however is used in the resize controller as it generates the resize based of the number of files being fed to the class's constructor.

Structural Design Pattern:

Composite Pattern: The Resizer object one for the file size and one for the pixel-based resizing are made of composite objects or children objects like the ImagesIO object. This nesting is also seen when we use the G2D object to generate new images from old images.

Behavioural Design Pattern:

Iterator Pattern: The Batch processing class processes the images in an iterative manner without showing the underlying which is said to be the iterator pattern's design.

Strategy Pattern: The strategy patter implements subprocesses and uses them interchangeably

LINK TO CODEBASE

[HTTPS://GITHUB.COM/NEERAJG03/IMAGE-RESIZER-USING-JAVA](https://github.com/NEERAJG03/IMAGE-RESIZER-USING-JAVA)

CONTRIBUTIONS

Tushar N Kumar: Format Changing, Upscaling of images and has-a relationship connection.

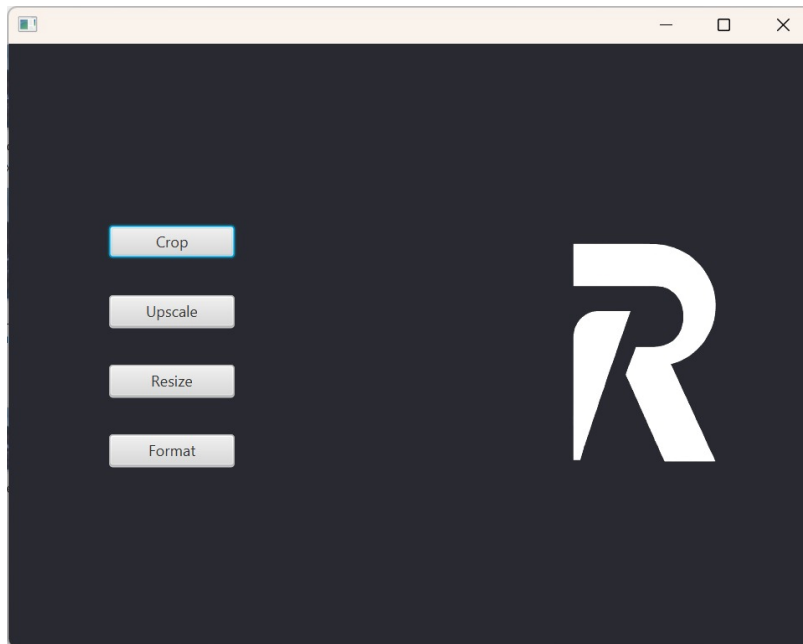
Tellakula Mohan Sai: Image cropping using aspect ratio, Image resizing using pixel density and controller connection.

Neeraj Gopalakrishnan: Image Resizer using batch processing and file size, UI creation, controller connection and process building.

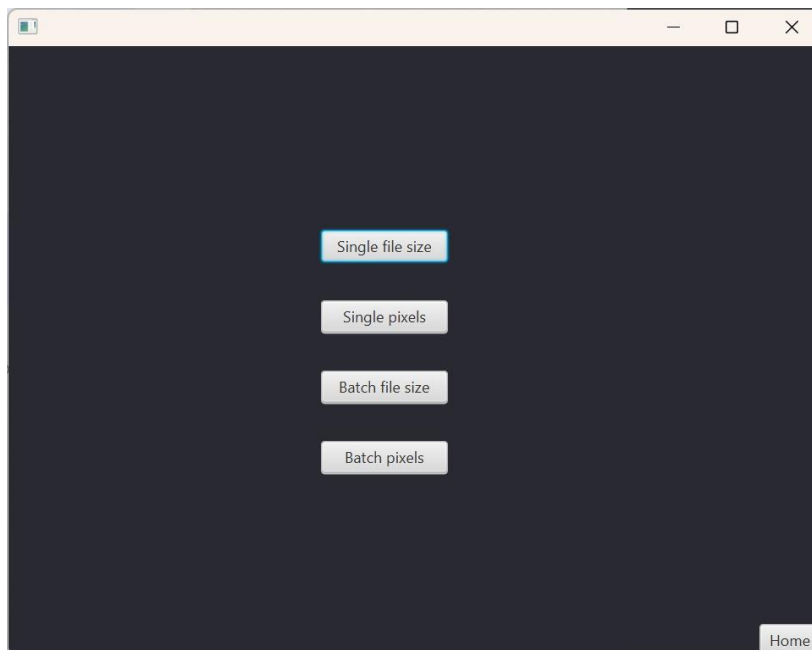
Tejas Goyal: Image resizing using file size and Image resizing as batch processing using Pixel density

SCREENSHOTS

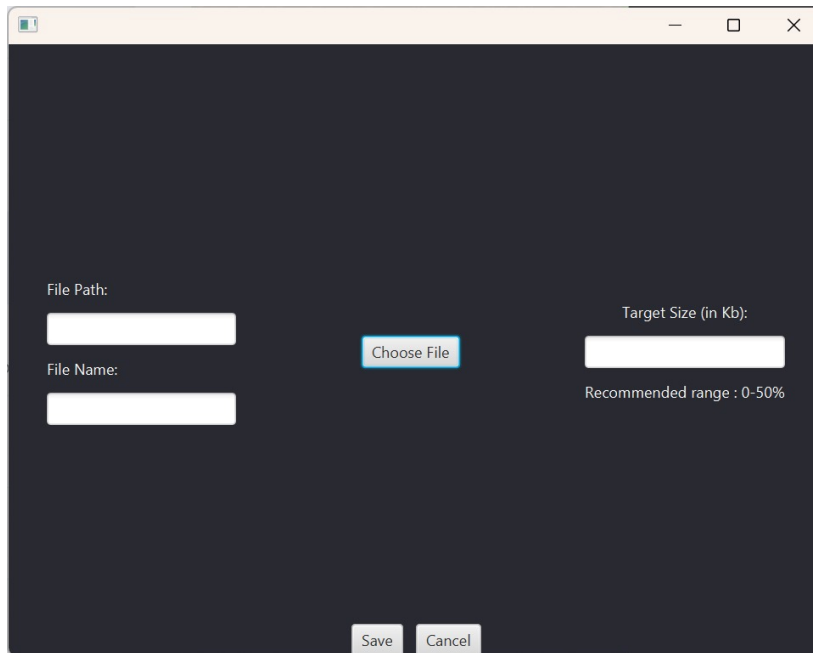
Home Page



Resize Home Page



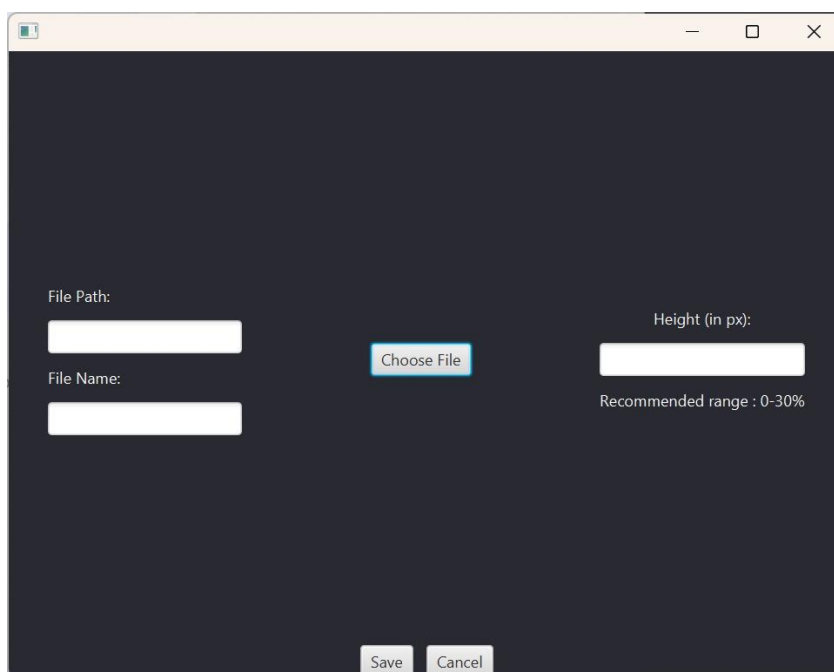
Single file size resizer page



A screenshot of a Java Swing window titled "Single file size resizer page". The window has a dark blue background and a light gray title bar with standard Windows window controls (minimize, maximize, close). The interface contains the following elements:

- File Path:** A text label followed by a white rectangular input field.
- File Name:** A text label followed by a white rectangular input field.
- Choose File:** A blue button with white text, positioned between the File Path and File Name fields.
- Target Size (in Kb):** A text label followed by a white rectangular input field.
- Recommended range : 0-50%:** A text label positioned below the Target Size input field.
- Save:** A gray button with black text, located at the bottom center.
- Cancel:** A gray button with black text, located to the right of the Save button.

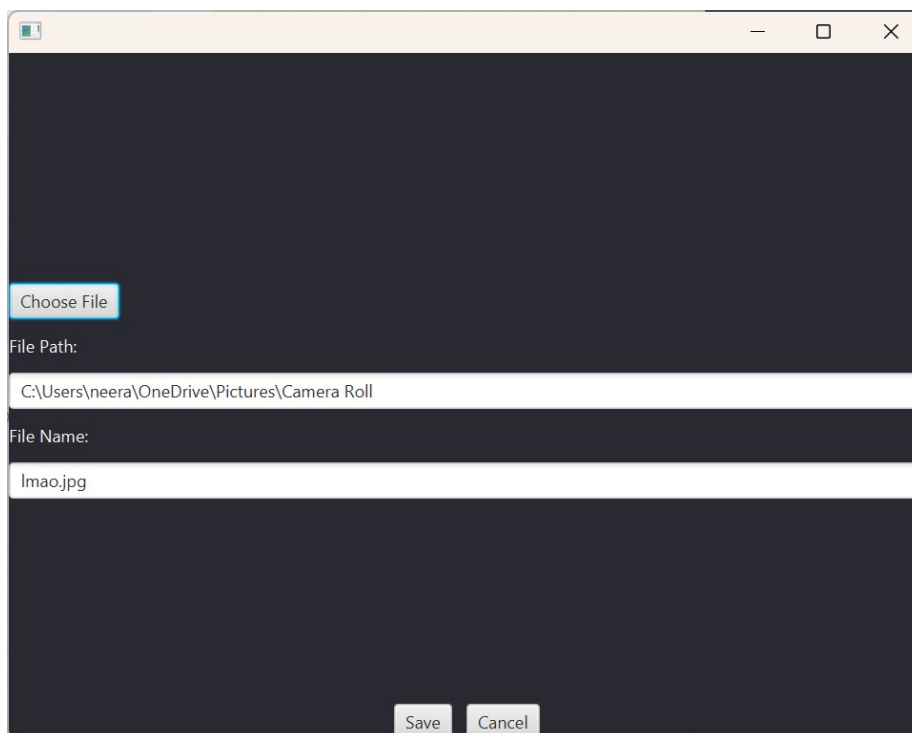
Single pixel resize page



A screenshot of a Java Swing window titled "Single pixel resize page". The window has a dark blue background and a light gray title bar with standard Windows window controls (minimize, maximize, close). The interface contains the following elements:

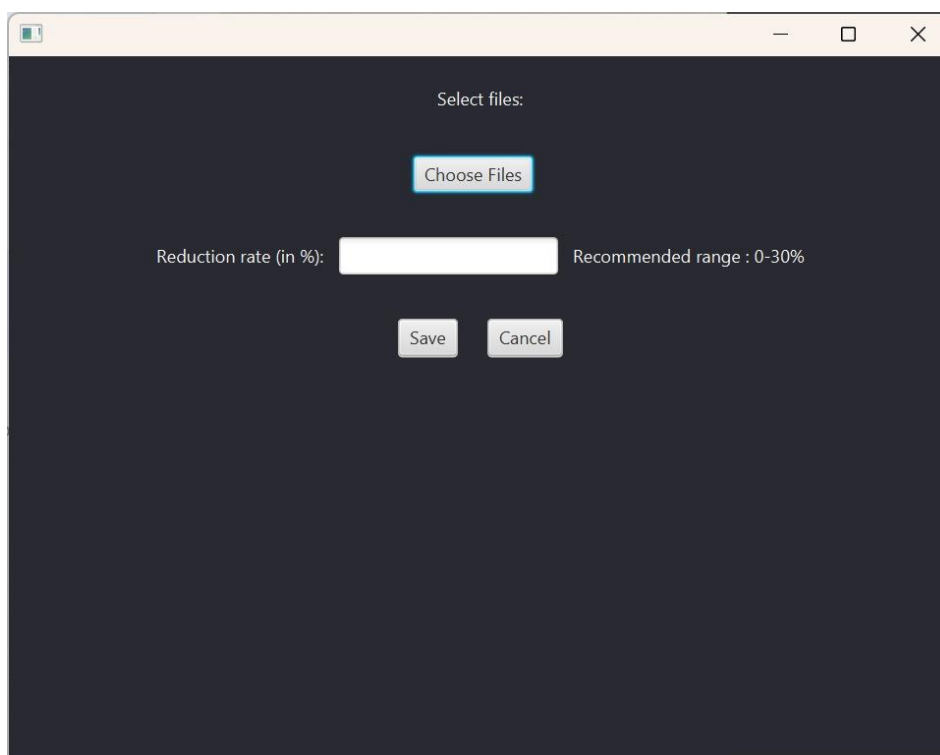
- File Path:** A text label followed by a white rectangular input field.
- File Name:** A text label followed by a white rectangular input field.
- Choose File:** A blue button with white text, positioned between the File Path and File Name fields.
- Height (in px):** A text label followed by a white rectangular input field.
- Recommended range : 0-30%:** A text label positioned below the Height input field.
- Save:** A gray button with black text, located at the bottom center.
- Cancel:** A gray button with black text, located to the right of the Save button.

Upscale page



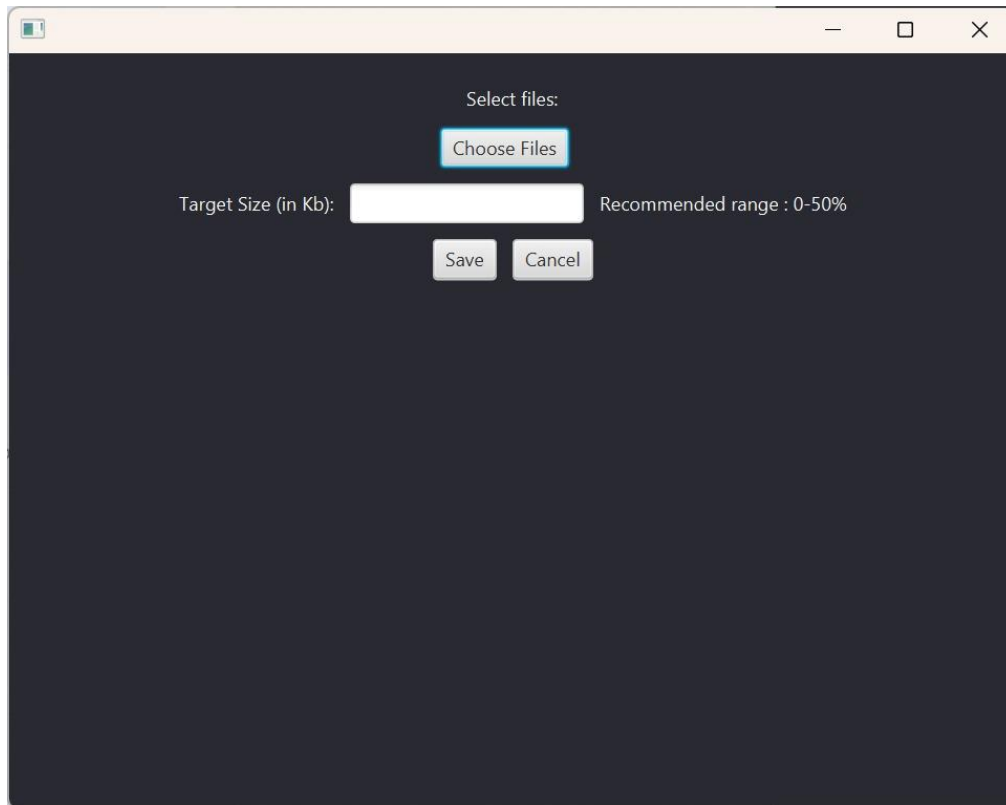
A screenshot of a Java application window titled "Upscale page". The window has a dark background and a light-colored title bar with standard Windows window controls (minimize, maximize, close). The main content area contains a "Choose File" button with a blue border. Below it, the text "File Path:" is followed by a text input field containing the path "C:\Users\neera\OneDrive\Pictures\Camera Roll". Below that, the text "File Name:" is followed by a text input field containing "Imao.jpg". At the bottom right of the window, there are two buttons: "Save" and "Cancel".

Batch file size resizer page



A screenshot of a Java application window titled "Batch file size resizer page". The window has a dark background and a light-colored title bar with standard Windows window controls (minimize, maximize, close). The main content area contains the text "Select files:" followed by a "Choose Files" button with a blue border. Below this, the text "Reduction rate (in %):" is followed by a text input field. To the right of the input field, the text "Recommended range : 0-30%" is displayed. At the bottom right of the window, there are two buttons: "Save" and "Cancel".

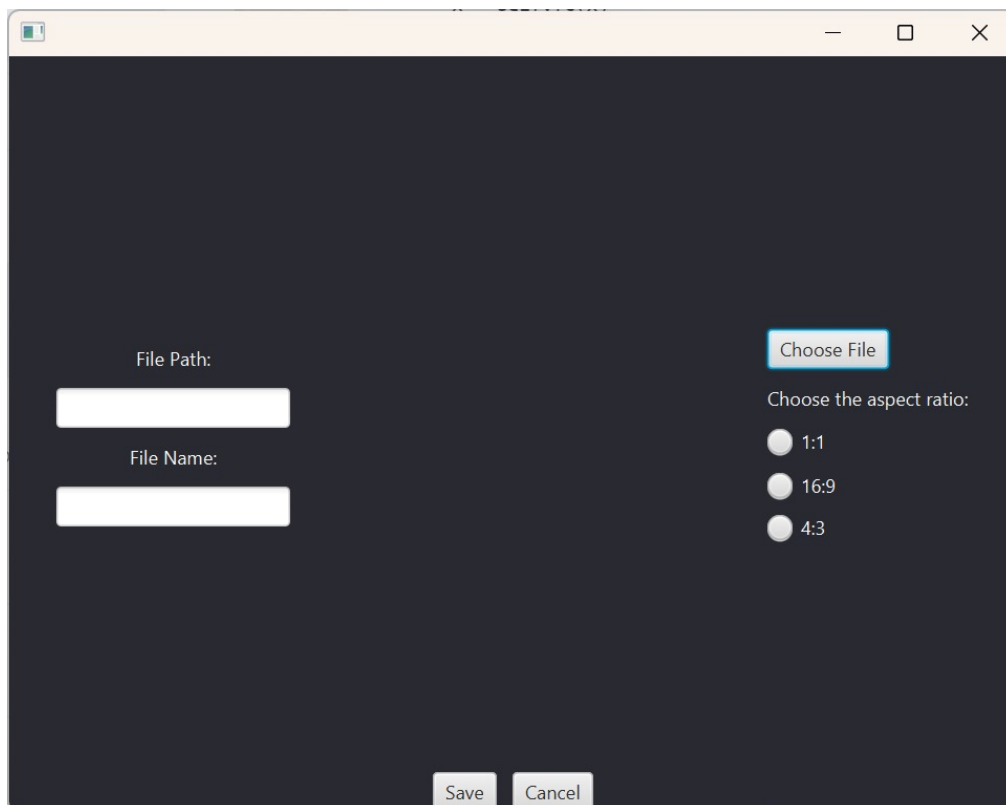
Batch pixel resize



A Java Swing dialog box titled "Batch pixel resize". It has a dark blue background and a light gray title bar with standard window controls. The dialog contains the following elements:

- Select files:** A label above a blue "Choose Files" button.
- Target Size (in Kb):** A label to the left of a white text input field.
- Recommended range : 0-50%**: A text label to the right of the input field.
- Save** and **Cancel**: Two gray buttons at the bottom center.

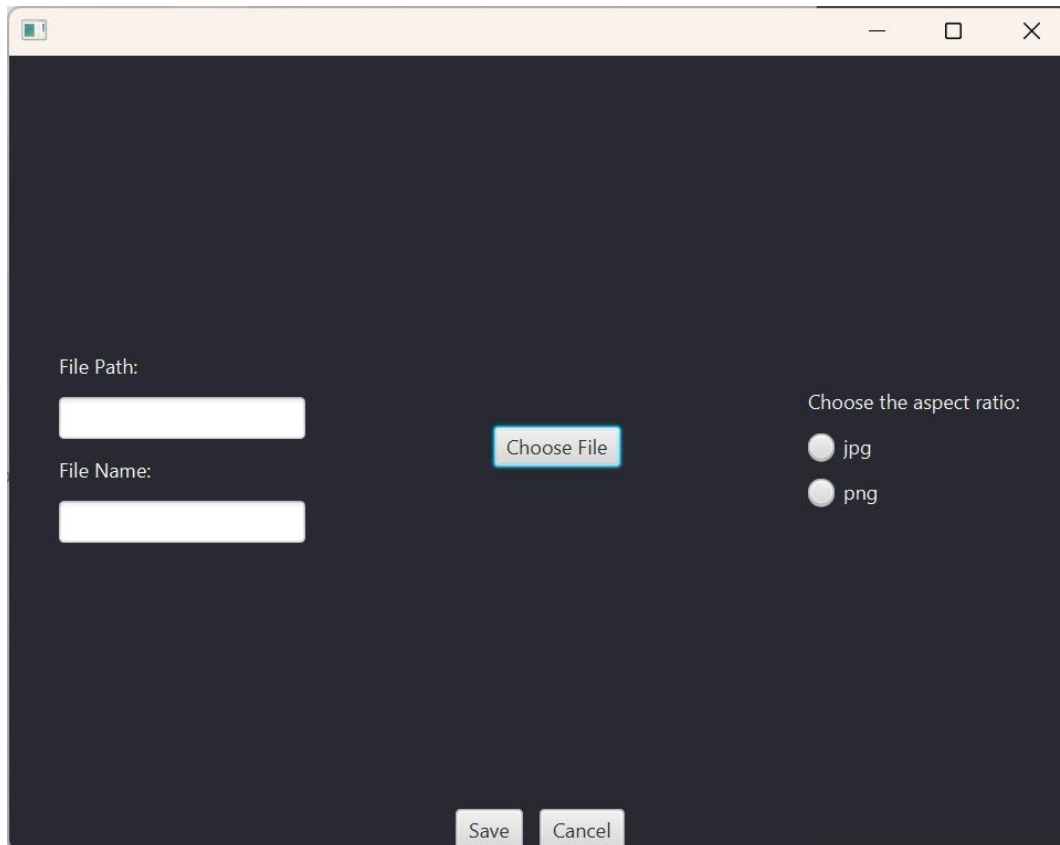
Croppage



A Java Swing dialog box titled "Croppage". It has a dark blue background and a light gray title bar with standard window controls. The dialog contains the following elements:

- File Path:** A label above a white text input field.
- File Name:** A label above a white text input field.
- Choose File**: A blue button.
- Choose the aspect ratio:** A label above three radio button options:
 - ☐ 1:1
 - ☐ 16:9
 - ☐ 4:3
- Save** and **Cancel**: Two gray buttons at the bottom center.

Format page



A window titled "Format page" with a dark background. It contains two text input fields on the left: "File Path:" and "File Name:". A "Choose File" button is positioned between these fields. To the right, under the heading "Choose the aspect ratio:", there are two radio buttons labeled "jpg" and "png". At the bottom center, there are "Save" and "Cancel" buttons.

File selector UI

