HW1 Report

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Introduction

This homework consists of the following two parts:

Part 1. A program is built with python to flip an image vertically, horizontally, and diagonally.

Part 2. *Gimp*, a free image editor, is used to do image rotation, scaling, and binarizing.

Part 1

1.1. Directory Layout

```
.
├── main.py
├── imageTransform.py
└── lena.bmp
```

1.2. Usage

Run the following command in the terminal.

```
python3 main.py -s <source>
```

Parameters

`-s <source>` : the file path of source image, default = `lena.bmp`

1.3. Source Code

1.3.1 main.py

Imports functions from `ImageTransform` class to flip the source image vertically, horizontally, and diagonally. The three result images will be saved under current directory.

1.3.2 imageTransform.py

Implements the `ImageTransform` class including the following functions:

`flip_vertically`

Returns a vertically flipped image by *reversing the order of the rows* in the source image.

`flip_horizontally`

Returns a horizontally flipped image by *reversing the order of the columns* in the source image.

`flip_diagonally`

Returns a diagonally flipped image along the top-left to bottom-right diagonal line by *swapping the row and the column* of each pixel in the source image.

1.4. Results

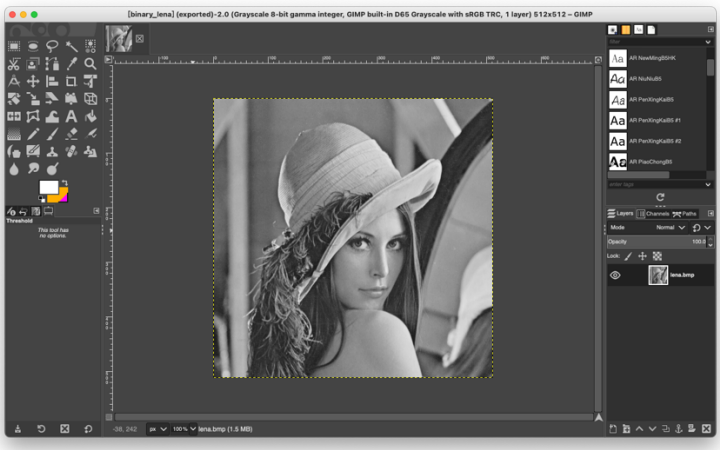
Vertically Flipped	Horizontally Flipped	Diagonally Flipped
		

Part 2

2.1. Gimp

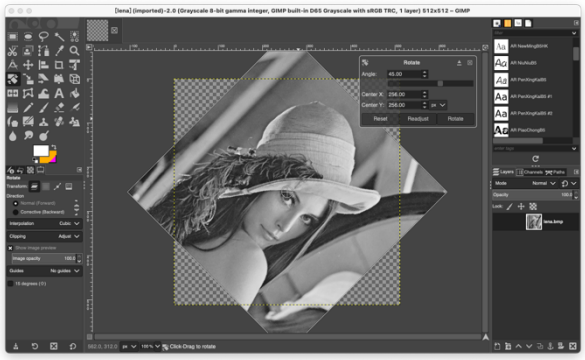
Official website: https://www.gimp.org/

Software Interface

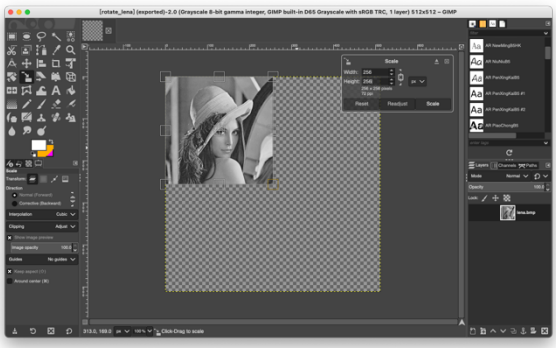


2.2. Results

2.2.1 Rotate 45 degrees clockwise

Editing screenshot	Result Image
	

2.2.2 Scale down to half size

Editing screenshot	Result Image
	

2.2.3 Binarize with threshold 128

Editing screenshot	Result Image