**HW1 Report**

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**Introduction**

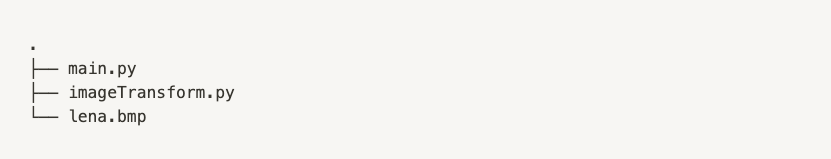
This homework consists of the following two parts:

**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.

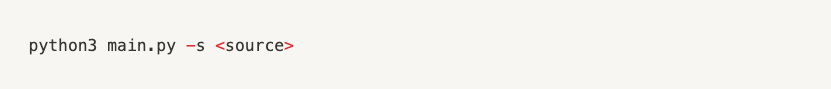
**Part 1**

**1.1. Directory Layout**



**1.2. Usage**

Run the following command in the terminal.



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 |
| **一張含有 個人, 白色 的圖片  自動產生的描述** | **一張含有 個人, 女性, 白色 的圖片  自動產生的描述** |  |

**Part 2**

**2.1. Gimp**

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



Software Interface

一張含有 文字, 監視器, 螢幕擷取畫面, 電子用品 的圖片

自動產生的描述

**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 |
| **一張含有 文字, 螢幕擷取畫面, 監視器 的圖片  自動產生的描述** | **一張含有 個人, 女性, 室外, 白色 的圖片  自動產生的描述** |

2.2.3 Binarize with threshold 128

|  |  |
| --- | --- |
| Editing screenshot | Result Image |
| **一張含有 文字, 螢幕擷取畫面, 監視器, 電腦 的圖片  自動產生的描述** | **一張含有 文字 的圖片  自動產生的描述** |