Computer Vision HW1 Report

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Part 1

(a)

```python
def upside_down(img):
  """ Vertically mirror the image."""
  img_size = img.shape
  img_H = img_size[0]

  result = np.zeros(img_size, np.int)
  for i in range(img_H):
    result[i, :, : ] =  img[img_H – 1– i, :, : ]

  return result
```

(b)

```python
def right_side_left(img):
  """ Horizontally mirror the image."""
  img_size = img.shape
  img_W = img_size[1]

  result = np.zeros(img_size, np.int)
  for i in range(img_W):
    result[:, i, : ] =  img[:, img_W- 1- i, : ]

  return result
```

(c)

```
def diagonal_flip(img):
    """Diagonal flip the image"""
    ud_img = upside_down(img)
    result = right_side_left(ud_img)

    return result
```

Part 2

(a)

Use python **imutils** to rotate the image.

```
def rotate(img, angle):
    """Rotate image with angle counterclockwise"""
    result = imutils.rotate(img, angle = angle)

    return result
```

(b)

```
def shrink_half(img):
    img_size = img.shape
    new_size = int(img_size[0] / 2)
    result = cv2.resize(img, (new_size, new_size),
interpolation=cv2.INTER_AREA)

    return result
```

(c)

```
def binarize(img, threshold):
    val, result = cv2.threshold(img, threshold, 255, 0)

    return  result
```