

Python Image Processing Tutorial: Downloading Images and Performing Flip Operations

In this tutorial, we will learn how to download images using Python and perform basic image operations such as flipping and rotating using the Pillow library.

Prerequisites

Before we begin, make sure you have the following libraries installed in your Python environment:

- `requests`: for downloading images
- `Pillow`: for image processing

If you haven't installed these libraries yet, you can install them using pip:

```
```bash
pip install requests Pillow
```
```

Step 1: Downloading an Image

First, we need to download an image. We will use the `requests` library to accomplish this task.

```
...

import requests

def download_image(url, filename):
    response = requests.get(url)
    if response.status_code == 200:
        with open(filename, 'wb') as file:
            file.write(response.content)
    else:
        print(f"Error: Failed to download image from {url}")
```

Example usage

```
image_url = "https://example.com/image.jpg" # Replace with the URL of the image you want to
download
filename = "downloaded_image.jpg"
download_image(image_url, filename)
...

```

Step 2: Opening and Displaying the Image

Next, we will use the `Pillow` library to open and display the image we just downloaded.

```

'''
from PIL import Image

def open_and_show_image(filename):
    image = Image.open(filename)
    image.show()

# Example usage
open_and_show_image(filename)
'''

```

Step 3: Flipping and Rotating the Image

Now we can perform flip and rotate operations on the image. The `Pillow` library provides several methods for image manipulation.

```

'''
def flip_image(filename, mode='horizontal'):
    image = Image.open(filename)
    if mode == 'horizontal':
        flipped_image = image.transpose(Image.FLIP_LEFT_RIGHT)
    elif mode == 'vertical':
        flipped_image = image.transpose(Image.FLIP_TOP_BOTTOM)
    else:
        print("Error: Mode should be 'horizontal' or 'vertical'")
        return
    flipped_image.show()
    return flipped_image

def rotate_image(filename, degrees):
    image = Image.open(filename)
    rotated_image = image.rotate(degrees)
    rotated_image.show()
    return rotated_image

# Example usage
flipped_image = flip_image(filename, mode='horizontal') # Horizontally flip
flipped_image.save("flipped_horizontal.jpg") # Save the horizontally flipped image

flipped_image = flip_image(filename, mode='vertical') # Vertically flip
flipped_image.save("flipped_vertical.jpg") # Save the vertically flipped image

rotated_image = rotate_image(filename, 90) # Rotate by 90 degrees
rotated_image.save("rotated_90.jpg") # Save the rotated image
'''

```

```
'''
```

Step 4: Saving the Modified Image

In the examples above, we have seen how to save flipped and rotated images. You can use the `save` method to save any modified image.

```
'''
```

```
# Save the image
```

```
def save_image(image, filename):
```

```
    image.save(filename)
```

```
# Example usage
```

```
save_image(flipped_image, "flipped_image.jpg")
```

```
save_image(rotated_image, "rotated_image.jpg")
```

```
'''
```

By now, you have learned how to download images using Python and perform basic image operations using the Pillow library. You can extend these basics to implement more complex image processing functions as needed.