1. What does RGBA stand for?

2. From the Pillow module, how do you get the RGBA value of any images?

3. What is a box tuple, and how does it work?

4. Use your image and load in notebook then, How can you find out the width and height of an Image object?

5. What method would you call to get Image object for a 100×100 image, excluding the lower-left quarter of it?

6. After making changes to an Image object, how could you save it as an image file?

7. What module contains Pillow’s shape-drawing code?

8. Image objects do not have drawing methods. What kind of object does? How do you get this kind of object?

Answer

1. **RGBA** stands for **red**, **green**, **blue**, and **alpha**. [It’s an extension of the RGB color model, where the alpha channel represents transparency1](https://en.wikipedia.org/wiki/RGBA_color_model).
2. To get the RGBA value of an image using the Pillow module (PIL), you can use the getpixel() method. Here’s an example:

**Python**

from PIL import Image

# Open an image

image\_path = 'path/to/your/image.png'

img = Image.open(image\_path)

# Get the RGBA value at a specific pixel (e.g., coordinates x=10, y=20)

rgba\_value = img.getpixel((10, 20))

print(f"RGBA value at (10, 20): {rgba\_value}")

1. A **box tuple** defines a rectangular region within an image. It consists of four values: (left, upper, right, lower). These values represent the coordinates of the box edges (left, top, right, bottom). For example, (10, 20, 50, 60) defines a box from (10, 20) to (50, 60) in the image.
2. To find out the width and height of an Image object, you can use the .size attribute:

**Python**

width, height = img.size

print(f"Image width: {width}, height: {height}")

1. To get an Image object for a 100×100 image, excluding the lower-left quarter, you can crop the image using a box tuple:

**Python**

# Crop the upper-right quarter (excluding lower-left quarter)

cropped\_box = (0, 0, width // 2, height // 2)

cropped\_img = img.crop(cropped\_box)

1. To save changes made to an Image object, use the .save() method:

**Python**

# Modify the image (e.g., resize, filter, etc.)

# ...

# Save the modified image

output\_path = 'path/to/output/image.png'

cropped\_img.save(output\_path)

1. Pillow’s shape-drawing code is part of the ImageDraw module. You can use it to draw shapes (lines, rectangles, circles, etc.) on an image:

**Python**

from PIL import ImageDraw

# Create an ImageDraw object

draw = ImageDraw.Draw(img)

# Draw a red rectangle (left, upper, right, lower)

draw.rectangle([(20, 30), (80, 70)], outline='red')

# Save the modified image

img.save(output\_path)

1. Image objects themselves don’t have drawing methods. To draw on an image, you need an ImageDraw object (as shown above). You create an ImageDraw object from an existing Image object.