Assignment 14:

## Q1

RGBA stands for Red Green Blue Alpha. It is a colour model that represents colours using combinations of red, green, and blue primary colours, along with an alpha channel that represents the transparency or opacity of the colour.

In RGBA, each component (red, green, blue, and alpha) is represented by an integer value ranging from 0 to 255. The alpha channel determines the degree of transparency, where 0 represents fully transparent and 255 represents fully opaque.

## Q2

Open the image file by using the **Image.open()** function.

Convert it to RGBA mode using the **Image.convert()** method.

Once the image is in RGBA mode, we can access the pixel data using the Image.getdata() method. This method returns a sequence of pixel values.

To retrieve the RGBA values of each pixel, we can iterate over the pixel data using a loop.

## Q3

A box tuple refers to a tuple that defines a rectangular region or bounding box within an image. It is commonly represented as a tuple of four integers (left, upper, right, lower).

The left value represents the x-coordinate of the leftmost pixel in the box, while the upper value represents the y-coordinate of the topmost pixel. The right value represents the x-coordinate of the rightmost pixel, and the lower value represents the y-coordinate of the bottommost pixel.

The box tuple is used to specify a region of interest within an image, such as cropping or extracting a specific area.

## Q4

To find out the width and height of an Image object using the Pillow library in Python, we can use the size attribute of the Image object.

from PIL import Image

# Open the image file

image = Image.open('image.jpg')

# Get the width and height of the image

width, height = image.size

# Print the width and height

print(f"Width: {width}")

print(f"Height: {height}")

## Q5

To get an Image object for a 100x100 image, excluding the lower-left quarter of it, we can use the crop() method of the Image object from the Pillow library.

from PIL import Image

# Open the original image

image = Image.open('image.jpg')

# Define the coordinates for the upper-right corner of the desired region

upper\_right = (100, 100)

# Crop the image to exclude the lower-left quarter

cropped\_image = image.crop((0, 0, upper\_right[0], upper\_right[1]))

# Display the cropped image

cropped\_image.show()

## Q6

After making changes to an Image object using the Pillow library, we can save it as an image file using the **save()** method.

image.save('modified\_image.jpg')

## Q7

The module that contains Pillow’s shape-drawing code is the ImageDraw module. The ImageDraw module provides a variety of methods for drawing shapes on images. These methods include drawing lines, rectangles, circles, ellipses, polygons, and text.

## Q8

Image objects do not have drawing methods because they are immutable. This means that they cannot be changed once they have been created. If we want to draw on an image, we need to create a Draw object.

A Draw object is a mutable object that can be used to draw on images. we can create a Draw object by calling the **draw()** method on an Image object.