Approximate calculation of a smaller area which is enclosed in a bigger area

Problem:

Given map of India, calculate the area of Maharashtra.

Here we have been given the map of India (Map_India_with_MH.png) with Maharashtra (MH) marked on it with different color. Also given is Area of India as 3.287 million km².

(The actual Area of Maharashtra is 307,713 km^2, therefore, our calculation should be approximately / near to the actual area of MH.

Concept:

Put dots on the map of India randomly, including Maharashtra, then count dots in Rest of India area and dots in Maharashtra area. Then do the calculation as:

Area of MH= (count of dots in MH area/ count of dots in Rest of India area)*3287263

Where, Area of India as 3.287 million km²

Steps to be done:

a) Select image of map of India with MH marked on it. (shared with you all)
b) Understand how image is represented in array/matrix form using numpy (not used in our final program but required to understand the image representation) (image_rgb.py)
c) Understand how to open image using either PIL or scipy (AreaCalcMH-1stMethod-class.py or AreaCalcMH-2ndMethod.py)
d) Understand how to convert image object to RGB mode (get_rgb.py)
e) How to find the dimension of our given image file (length X width = 450X450, found by right clicking our png file and checking for properties. Go to details in properties, you will find dimension as 450X450 (x and y values in our program will have range 0-449 each)
f) How to find RGB values of our map (two colors, Gold tips is the color of rest of India and Pomegranate is the color of MH). Use Online color picker tool given below.
RGB value of 'Gold tips' color of rest of India is (**237**, 195, 15), refer to our png file for India map
RGB value of Pomegranate color of Maharashtra is (**238**, 62, 15), refer to our png file for India map
g) To put dots, use random module to select randomly x and y between 0-449. Using the values received for x and y, then get RGB color for (x, y) using rgb_im.getpixel() function.
h) Compare R (red color) received by rgb_im.getpixel() function to R color of rest of India (**237**) and MH (**238**). If matches, increment count.
i) I am repeating steps g and h, 100000 times. You can experiment with this number to get area of MH closer to actual value.

1) Online Color Picker tools:

The following tool requires you to upload your image and then you can hover mouse on area for which you want to find out RGB values. Then you click on that area and RGB values are displayed

https://imagecolorpicker.com/en/

(I have given this one but there are many more!)

Here, I uploaded the image: Map_India_with_MH.png and then clicked on the required color/area

The values returned are:

Yellow: R= 237 G= 195 B= 15 (237, 195, 15)

Orange: R= 238 G= 62 B= 15 (238, 62, 15)

2) URLs for modules: scipy, PIL etc.:

https://docs.scipy.org/doc/scipy/reference/misc.html?highlight=scipy%20misc#module-scipy.misc

https://docs.scipy.org/doc/scipy/reference/search.html?q=scipy.misc&check_keywords=yes&area=default

https://docs.scipy.org/doc/scipy/reference/generated/scipy.misc.imread.html#scipy.misc.imread

http://effbot.org/imagingbook/pil-index.htm

http://effbot.org/imagingbook/image.htm