**DSP - Project**

1. Read the RGB image with the flowerpot. Display each color channel separately (Red, Green, Blue), convert the original RGB image to a grayscale image, and convert it to binary. **[1]**

A plant in a pot

Description automatically generated

1. Using the histogram of the grayscale image, find the threshold (s) that best describe the object (pot) of the image. Then display the result. **[1]**
2. Apply the following trasformations to the Image:
   1. Transpose
   2. Resize to dimentions 300x255
   3. Rotate 45 degrees left in the resized image (You’ll need PIL Library of python)
   4. Desplay the results in a figure 1x3. **[1.5]**
3. Add gaussian noise to the grayscale image (std = 50) **[1]**
4. Build your own 5x5 median filter and use it to remove noise from the image in question 4 without using the scipy convolve (scipy.ndimage.convolve) or other ready-made functions. **[1]**
5. Next, use the mask you made in query 5 and remove the noise using the convolve. Display in a 2x2 figure the original grayscale image, query image 4, query image 5, and query image 6. **[1]**
6. Read world\_map\_noise.png. Periodic noise has been added to the image. Use the appropriate butterworth filter to remove it. [1.5] In the result of the image of question 7, try with appropriate techniques and using labeling to show in a figure only South America. TIP: Use 8-neighborhood **[2]**

