

**e-Yantra Robotics Competition Plus**

**(eYRC+ Pilot)**

**<Please enter your team id here>**

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| --- | --- |
| **Team leader name** |  |
| **College** |  |
| **e-mail** |  |
| **Date** |  |

**Scope of the Task** (5)

Describe the task assigned.

<Teams should write in their own words a description of the task assigned. What is the purpose of such a system? What other kinds of problems can you think of, where solutions to this task can be applied? You can draw some diagrams/figures to illustrate the problem assigned to you.

Answer format: Text

Word-limit: 100 words>

**Camera and Image Processing** (8)

Write down the answers to the following questions.

1. What is the resolution (size) of the picture taken from your camera?
2. What is the resolution (size) of the test image assigned in the task?
3. What is the use of thresholding an image?
4. What is the use of color masks?

<

Answer format: Bulleted form

1. Answer to question 1

2. Answer to question 2

3. Answer to question 3 etc.

>

**Software used**  (7)

Write down the answers to the following questions.

1. Write a function in python to open a color image and convert the image into grayscale. You are required to write a function *color\_grayscale(filename,g)* which takes two arguments:
   1. filename: a color image (Test color image is in folder “Task1\_Practice/test\_images”. Pick first image to perform the experiment.)
   2. g: an integer

Output of program should be a grayscale image if g = 1 and a color image otherwise.

<Answer format:

Code for question 1, explanation of code in form of comments. Use the snippet given below to write the function. >

**def** color\_grayscale**(**filename**,**g**):**

'''

filename-- input color image stored as file(Test color image is in folder

“Task1\_Practice/test\_images”. Pick first image to perform the experiment.)

g -- int 0 or 1

returns img-- grayscale of input image if g=1 else color image

'''

#add your code here

**return(**img**)**

**2.** Write a function in python to return only the red portions of the image based on the appropriate HSV range.

< Answer format:

Use the snippet given below to write code for the function. Inline comments are mandatory to, explain the code. (Test color image is in folder Task1\_Practice/test\_images”. Pick first image to perform the experiment.)

>

**def** red\_threshold**(**img**,** hsv\_low**,** hsv\_high**):**

'''

img-- input color image stored as file (Test color image is in folder “Task1\_Practice/test\_images”. Pick first image to perform the experiment.)

hsv\_low-- int list for hsv low value eg. [50,200,300]

hsv\_high--int list for hsv high value eg. [100,255,255]

returns img--with red part only

'''

#add your code here

**return(**img**)**