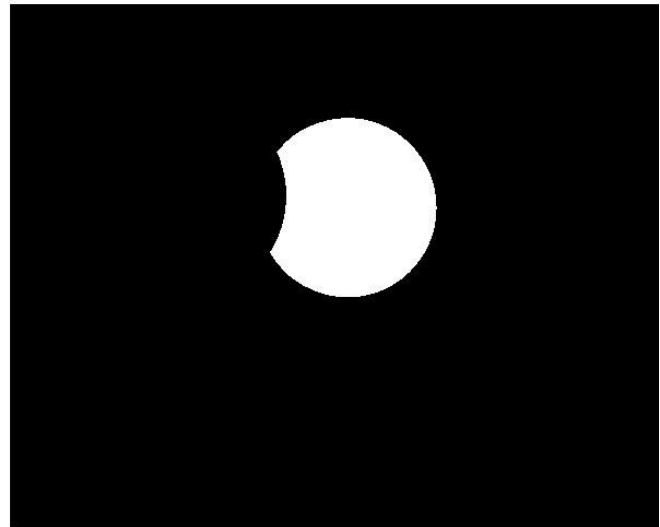
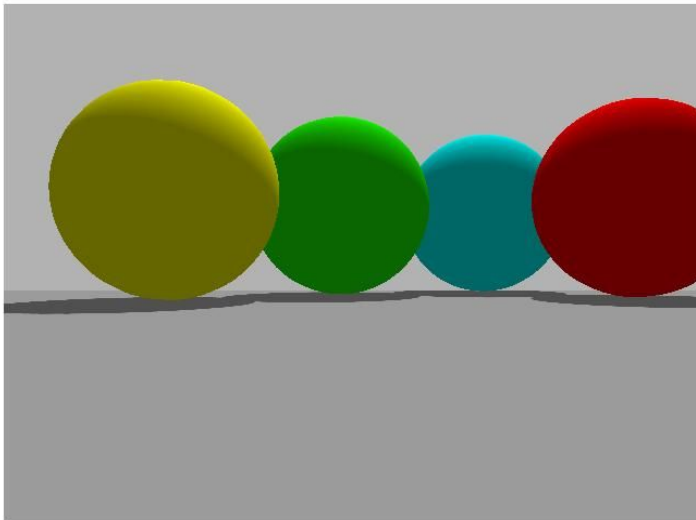


ME 144 LAB 3

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Lab Section: 021

Assignment 1: Color detection in the HSV color space

The goal is to write an algorithm to find the green ball in the environment and position the bot as to make the ball the center of the image. The bot's camera is RGB sensor, so our first picture is in RGB format. We translate this to Hue-Saturation-Value(HSV) format since it is much more convenient for our application. To find the correct HSV value for the green ball we only used hue, or color, value to distinguish it from its background. We found the threshold values to be $0.18 < H < 0.35$. With this we converted the image into a binary image that had ones only where the hue values were within our range. Then this image was used to find the position of the center of the ball. This was then compared with the center of our image. A P-Controller was again used to rotate the robot the correct amount.



1. *The RGB image from the bot.*
2. *Binary image using HSV threshold for green*

Assignment 2: Robot tracking

The goal for this part was to successfully keep track and follow another target robot around in the world. We were provided with the code to insert the second robot into the gazebo empty world, We used a similar tracking technique from part 1 to keep the robot within our sight. An additional P-Controller was created to move the bot. If the robot was lost the bot would stop and look around until the target robot was found. The K_r and K_l values for this lab had to be really small, $K_r = 0.0015$ and $K_l = 0.00030$ in order to stay within the bots allowed velocities.

