ECE 320: Handout #7

LEDs

The specifications for an RGB LED are

Color	Vf @ 20mA	mcd @ 20mA
Red	1.9V	10,000
Green	3.0V	10,000
Blue	3.0V	10,000

1) Assume Rr = 1k. Determine how bright the red LED is.

2) Find {Rr, Rg, Rb} so that the RGB LED outputs orange
   - Red = 8000 mcd
   - Green = 3000 mcd
   - Blue = 750 mcd
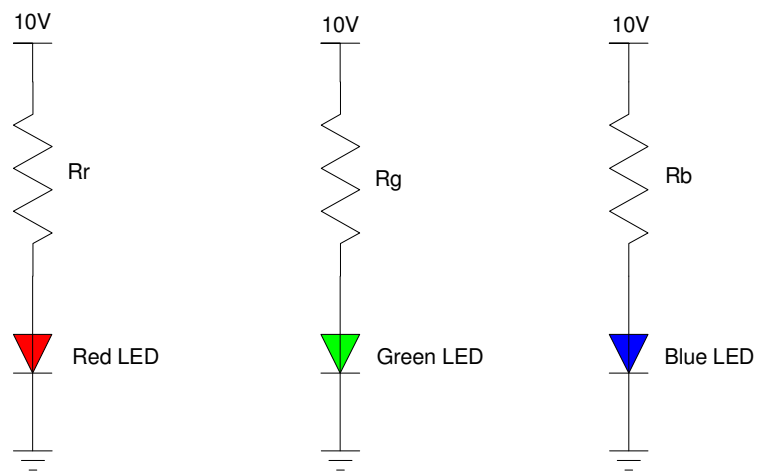
The specifications for an RGB LED are

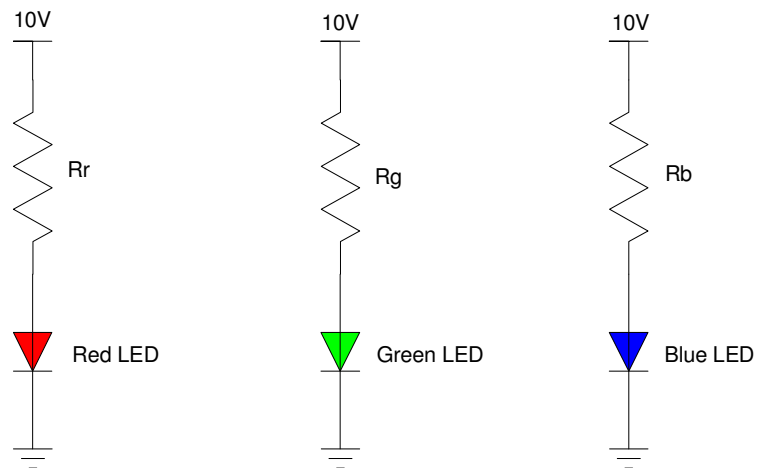| Color	Vf @ 20mA	mcd @ 20mA
Red	1.9V	10,000
Green	3.0V	10,000
Blue	3.0V	10,000

1) Assume Rr = 1k. Determine how bright the red LED is.

$$I_r = \left(\frac{10V - 1.9V}{1000} \right) = 8.1mA$$

$$mcd = \left(\frac{8.1mA}{20mA} \right) 10,000mcd$$

$$mcd = 4050mcd$$

-

2) Find {Rr, Rg, Rb} so that the RGB LED outputs orange
   - Red = 8000 mcd
   - Green = 3000 mcd
   - Blue = 750 mcd

$$I_r = \left(\frac{8000mcd}{10000mcd}\right) 20mA = 16.0mA$$

$$R_r = \left(\frac{10V - 1.9V}{16mA}\right) = 506.25\Omega$$

$$I_g = \left(\frac{3000mcd}{10000mcd}\right) 20mA = 6.0mA$$

$$R_g = \left(\frac{10V - 3.2V}{6mA}\right) = 1133\Omega$$

$$I_r = \left(\frac{750mcd}{10000mcd}\right) 20mA = 1.50mA$$

$$R_b = \left(\frac{10V - 3.2V}{1.5mA}\right) = 4533\Omega$$