



**Colors** are encoded by vectors  $\vec{v} = (r, g, b)$ , where the **red**, **green** and **blue** components are all numbers in the interval  $[0, 1]$ . Examples are:

$(0,0,0)$	black	$(0,0,1)$	blue
$(1,1,1)$	white	$(1,1,0)$	yellow
$(1/2,1/2,1/2)$	gray	$(1,0,1)$	magenta
$(1,0,0)$	red	$(0,1,1)$	cyan
$(0,1,0)$	green	$(1,1/2,0)$	orange
$(0,1,1/2)$	spring green	$(1,1,1/2)$	khaki
$(1,1/2,1/2)$	pink	$(1/2,1/4,0)$	brown

- Determine the angle between the colors magenta and cyan.
- Find a color which is both orthogonal to orange and yellow.
- What does the scaling  $\vec{v} \mapsto \vec{v}/2$  do, if  $\vec{v}$  represents a color?
- If  $\vec{v}$  and  $\vec{w}$  are two colors, their mixture  $(\vec{v} + \vec{w})/2$  is also a color. What is the mixture of red and white?
- Vectors on the diagonal  $r = g = b$  are called **gray** colors. Find the gray vector which is the vector projection of yellow onto white.
- Find the cos of the angle between "white" and "yellow".