CS 230, Quiz 1

Solutions

Problem 1 (2 points)

Why do we use red, green, and blue when producing images? Why not two or four colors instead of three? Why not a different set of three colors?

The human eye uses three types of color-sensitive cells to distinguish colors; these cells are most sensitive to red, green, and blue light. The eye thus perceives other colors as combinations of these colors.

Problem 2 (2 points)

Explain why (a) a flashlight shined on a nearby wall is much brighter than when shined on a far wall but (b) a laser pointer appears about the same brightness in both cases.

(a) A flashlight falls off with distance since the light rays spread out; the same amount of light energy illuminates a larger wall area. (b) Laser pointers do not spread out with distance, so the light does not fall off much. (A very small amount of light energy is lost through interactions with particles in the air.)

Problem 3 (2 points)

Given two vectors $\vec{u}$ and $\vec{w}$, how do we determine whether the vectors are orthogonal?

$\vec{u} \cdot \vec{w} = 0$