

Lighting

3 obj-color 2 int-pt 4 normal 5 light-loc 1 ray

ambient
color.R = 0.1 * obj-color.R

diffuse

$$\vec{L} = \text{light-loc} - \text{int-pt}$$

normalize $\vec{L}$

$$dp = \text{dot}(\vec{L}, \vec{N})$$

if ($dp > 0$)

$$\text{color.R} += dp * \text{obj-color.R}$$

specular

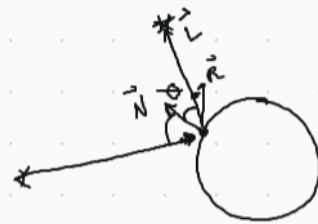
$$\vec{R} = \vec{L} - \vec{N} * 2 * dp$$

normalize $\vec{R}$

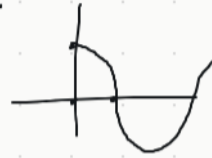
$$dp2 = \text{dot}(\vec{R}, \text{ray.dir})$$

if ($dp2 > 0$)

$$\text{color.R} += \text{pow}(dp2, 200)$$



$\cos \theta$



illuminate (

return color

return color.T (

rt.h
RAY_T
SPHERE_T
color_T

rt.c
intersect-sphere
illuminate

color.T trace
main {
 if intersect-sphere
 col = illuminate
 init obj
 init PPM file

for
 for
 init ray
 trace
 print PPM pixel

vp.h
VP_T
in prototypes

vp.c
len
normalize
dot v1 v2

$$= v1.x * v2.x + v1.y * v2.y + \dots$$