

# Computer Graphics

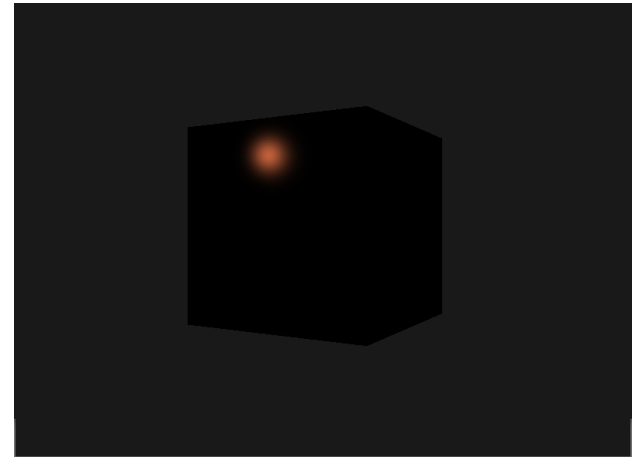
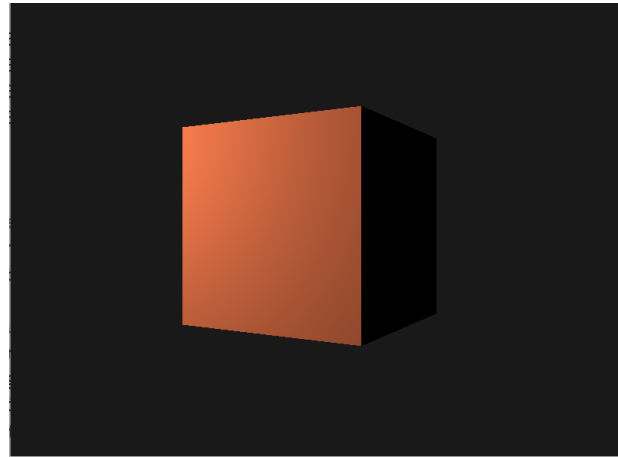
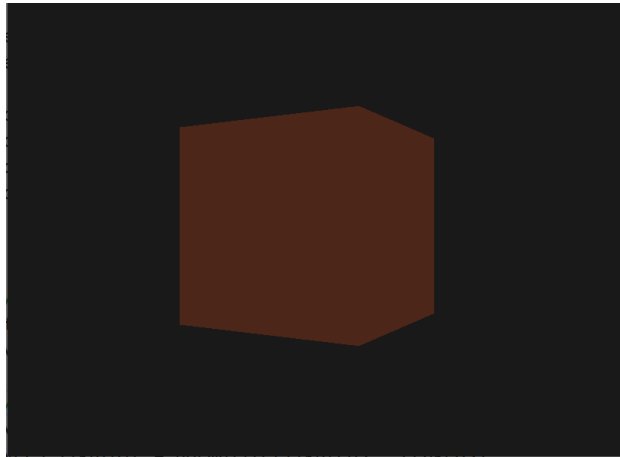
## - Lighting I (Questions)

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# Possible Questions

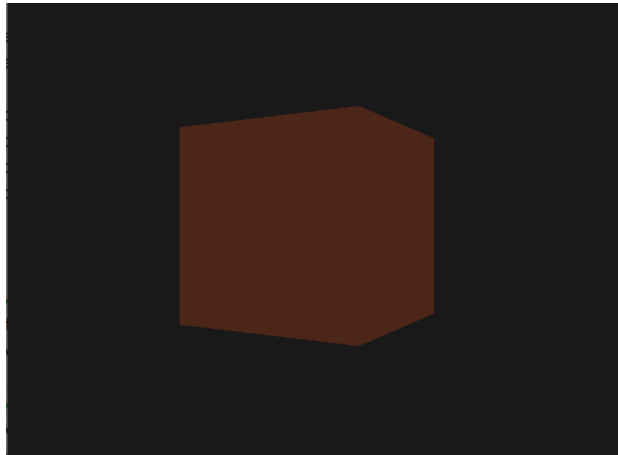
Name the three components of a Phong model and assign them:



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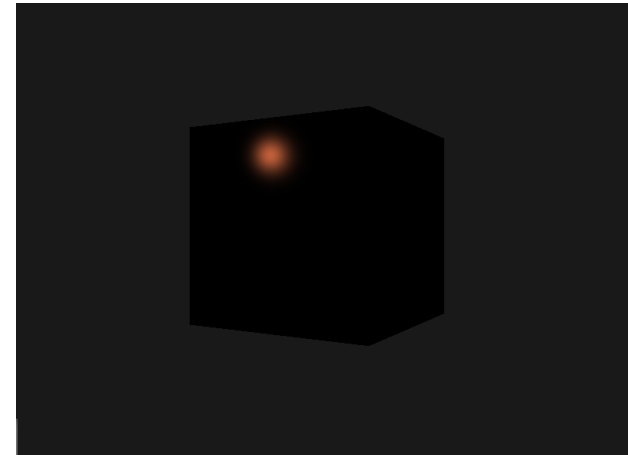
ambient



diffuse



specular lighting



# Possible Questions

What do we need to calculate diffuse lighting?

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- Normal vector (perpendicular to the surface)
- Directed light ray (light's position minus fragment's position)

# Possible Questions

Given is the model matrix  $M$ . Define the normal matrix:

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$$N = (M^T)^{-1}$$

# Possible Questions

Given is the view direction (`viewDir`) and the reflection direction (`reflectDir`). Determine the specular component:

```
float spec = pow(_____, 32);
```



# Possible Questions

Given is the view direction (viewDir) and the reflection direction (reflectDir). Determine the specular component:

```
float spec = pow(max(dot(viewDir, reflectDir), 0.0), 32);
```

# Possible Questions

$$f(x, y) = \begin{pmatrix} x \\ y \\ \cos(2 \cdot \sqrt{x^2 + y^2}) \end{pmatrix}$$

Calculate the derivatives:

$$\frac{\partial f_z(x, y)}{\partial x} =$$

$$\frac{\partial f_z(x, y)}{\partial y} =$$

# Possible Questions

$$f(x, y) = \begin{pmatrix} x \\ y \\ \cos(2 \cdot \sqrt{x^2 + y^2}) \end{pmatrix}$$

Calculate the derivatives:

$$\frac{\partial f_z(x, y)}{\partial x} = \frac{-2x \cdot \sin(2 \cdot \sqrt{x^2 + y^2})}{\sqrt{x^2 + y^2}}$$

$$\frac{\partial f_z(x, y)}{\partial y} = \frac{-2y \cdot \sin(2 \cdot \sqrt{x^2 + y^2})}{\sqrt{x^2 + y^2}}$$