



INF1761 – Computação Gráfica

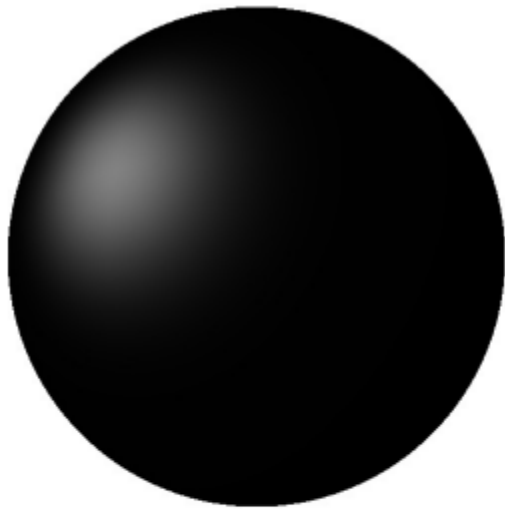
TRABALHO 2 – Iluminação - Phong

MARCELO PAULON

Informações Iniciais

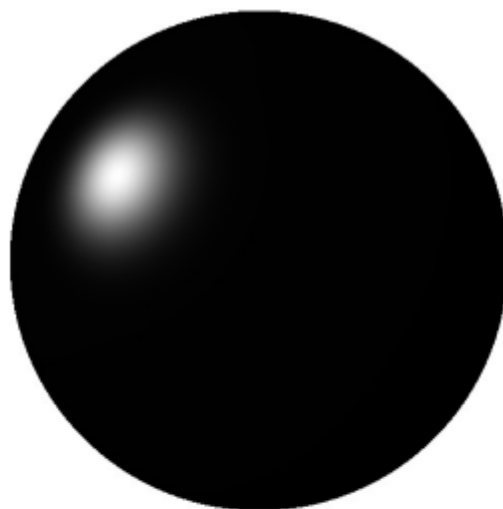
- ▶ Linguagem: C++
- ▶ Bibliotecas utilizadas: IUP, GLEW, Diredt
- ▶ Modelo de Iluminação: Phong
- ▶ Iluminação por vértice ou por fragmento
- ▶ 1 ou 2 fontes luminosas (próximas a câmera)
- ▶ Materiais¹: plástico preto, marfim preto, bronze
- ▶ Posição da câmera pode ser controlada a partir das teclas A,W,S,D,R,F

Materiais



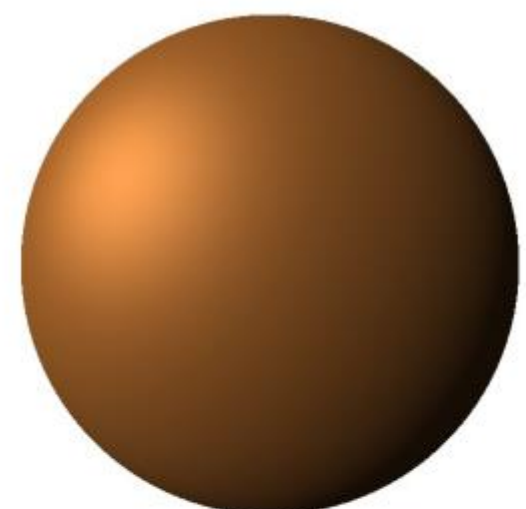
Plástico preto

Ambient = $\{r = 0.00, b = 0.00, g = 0.00, a = 1.0\}$
Diffuse = $\{r = 0.00, b = 0.00, g = 0.00, a = 1.0\}$
Specular = $\{r = 0.50, b = 0.50, g = 0.50, a = 1.0\}$
Shininess = 32



Marfim preto

Ambient = $\{r = 0.00, b = 0.00, g = 0.00, a = 1.0\}$
Diffuse = $\{r = 0.00, b = 0.00, g = 0.00, a = 1.0\}$
Specular = $\{r = 1.00, b = 1.00, g = 1.00, a = 1.0\}$
Shininess = 100

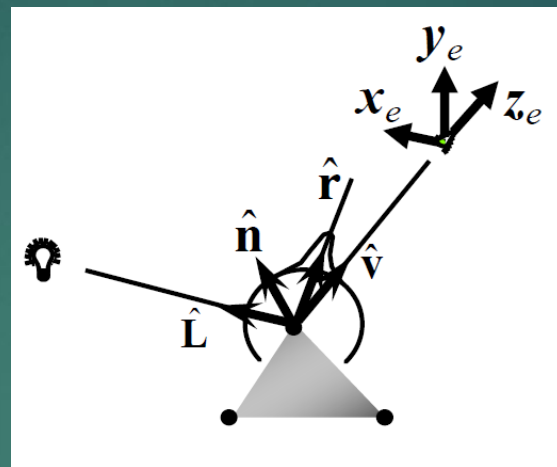


Bronze

Ambient = $\{r = 0.21, b = 0.13, g = 0.05, a = 1.0\}$
Diffuse = $\{r = 0.71, b = 0.43, g = 0.18, a = 1.0\}$
Specular = $\{r = 0.39, b = 0.27, g = 0.17, a = 1.0\}$
Shininess = 25.6

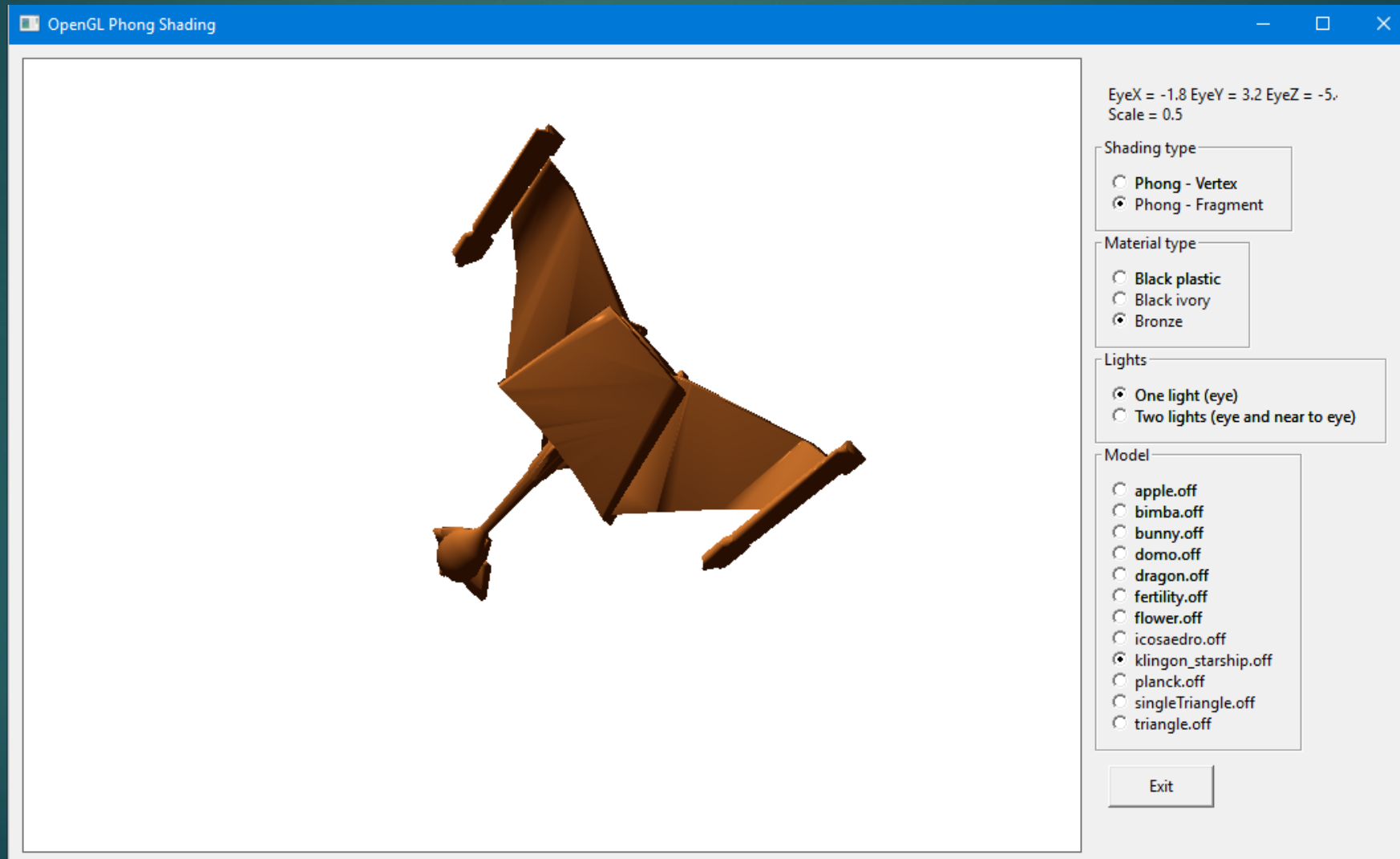
¹ <http://webserver2.tecgraf.puc-rio.br/~celes/docs/inf1339/iluminacao.pdf>

Modelo



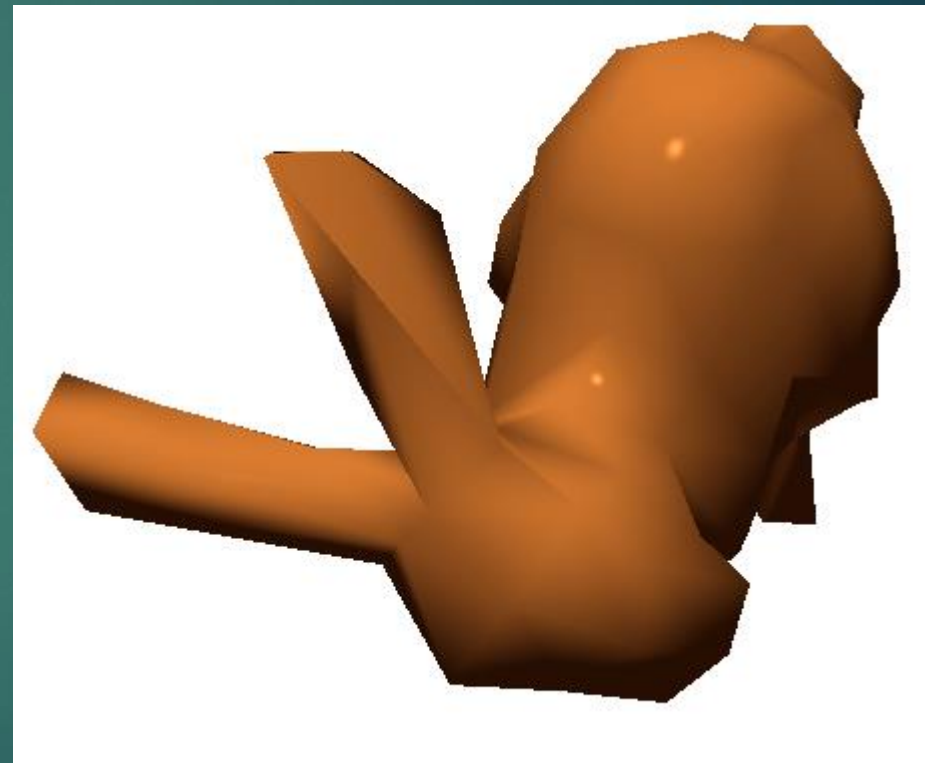
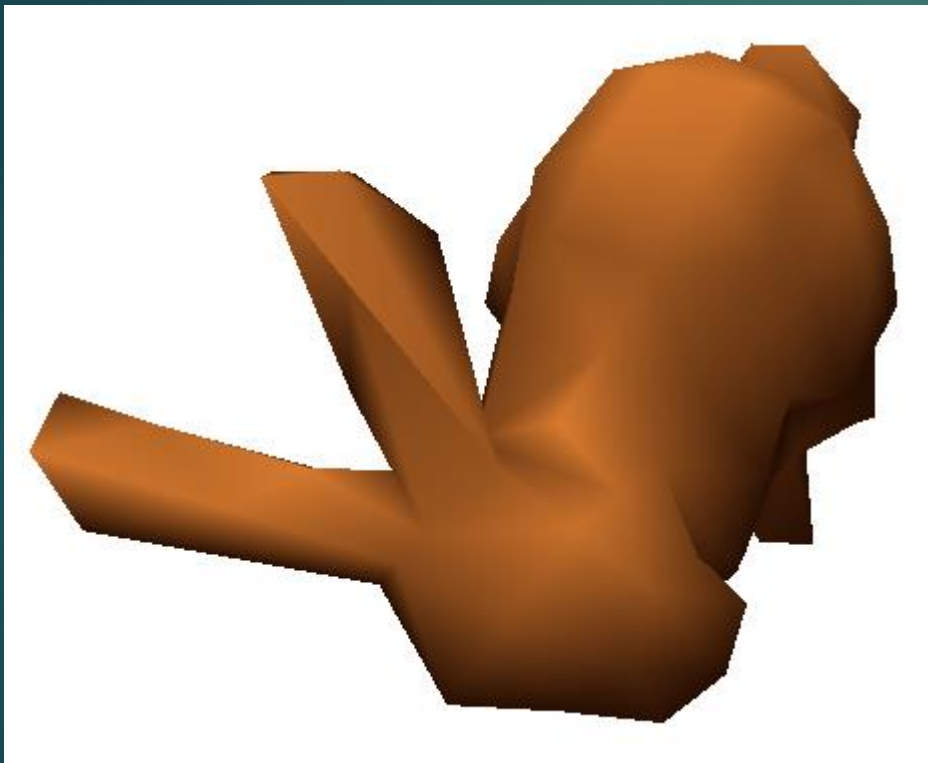
$$\begin{pmatrix} r \\ g \\ b \end{pmatrix} = \begin{pmatrix} r_a \\ g_a \\ b_a \end{pmatrix} \otimes \begin{pmatrix} r_d \\ g_d \\ b_d \end{pmatrix} + \sum_{l=1} \left(\begin{pmatrix} r_l \\ g_l \\ b_l \end{pmatrix} \otimes \begin{pmatrix} r_d \\ g_d \\ b_d \end{pmatrix} (\hat{\mathbf{n}} \cdot \hat{\mathbf{L}}) + \begin{pmatrix} r_l \\ g_l \\ b_l \end{pmatrix} \otimes \begin{pmatrix} r_s \\ g_s \\ b_s \end{pmatrix} (\hat{\mathbf{r}} \cdot \hat{\mathbf{v}})^n \right)$$

Interface



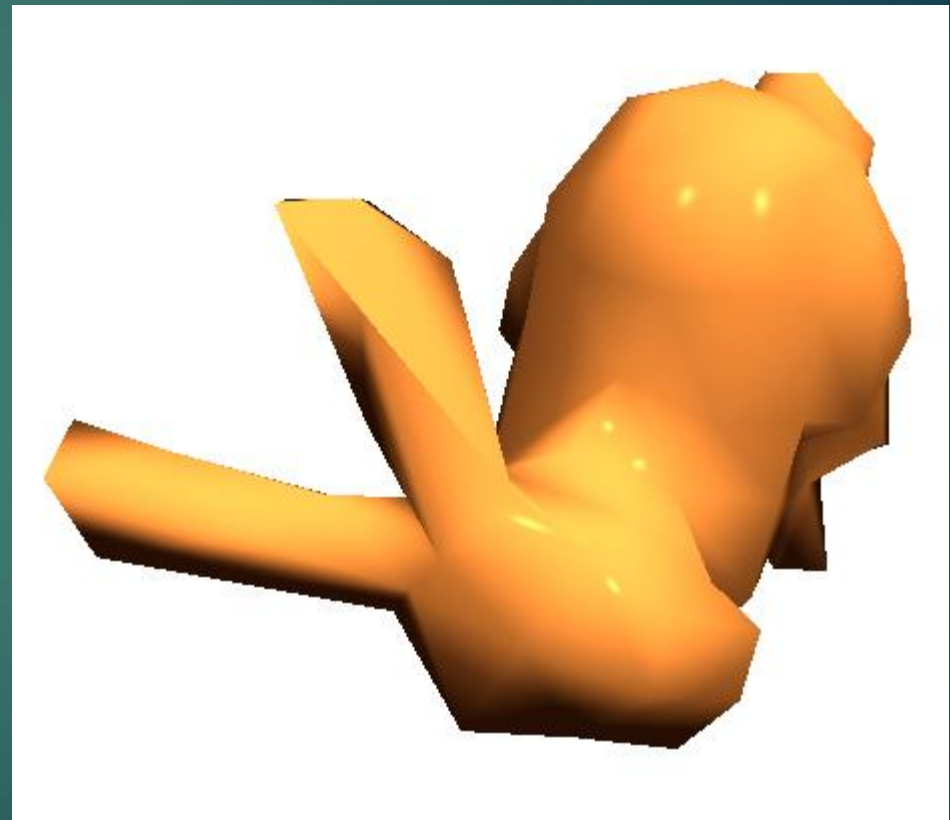
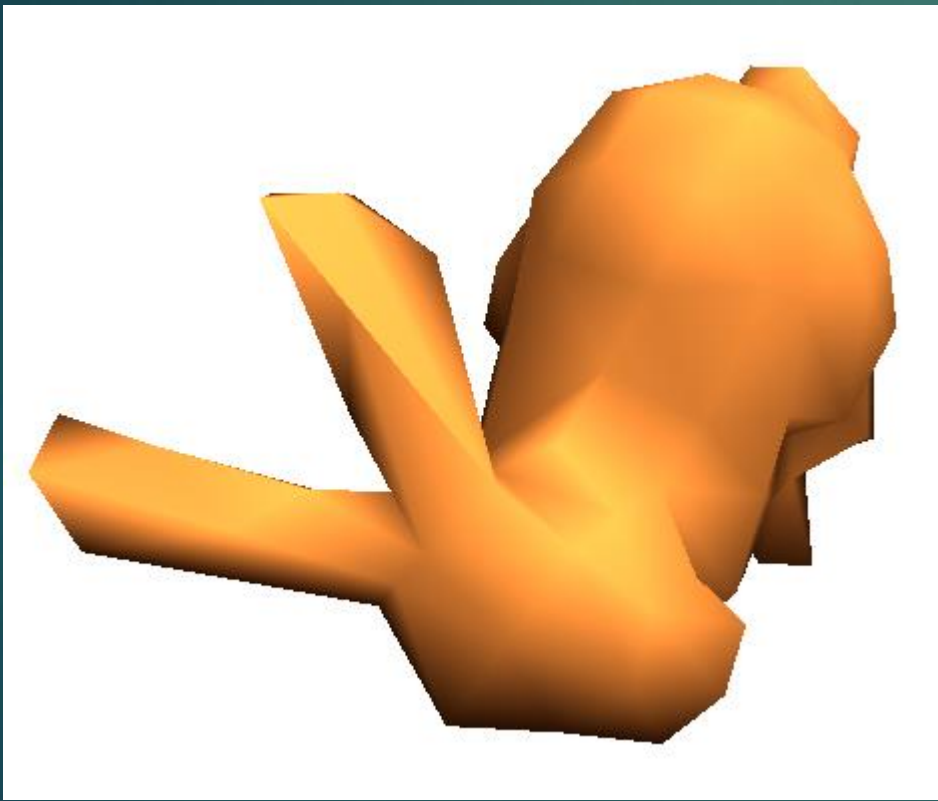
Diferença – Vértice / Fragmento

1 luz - bronze



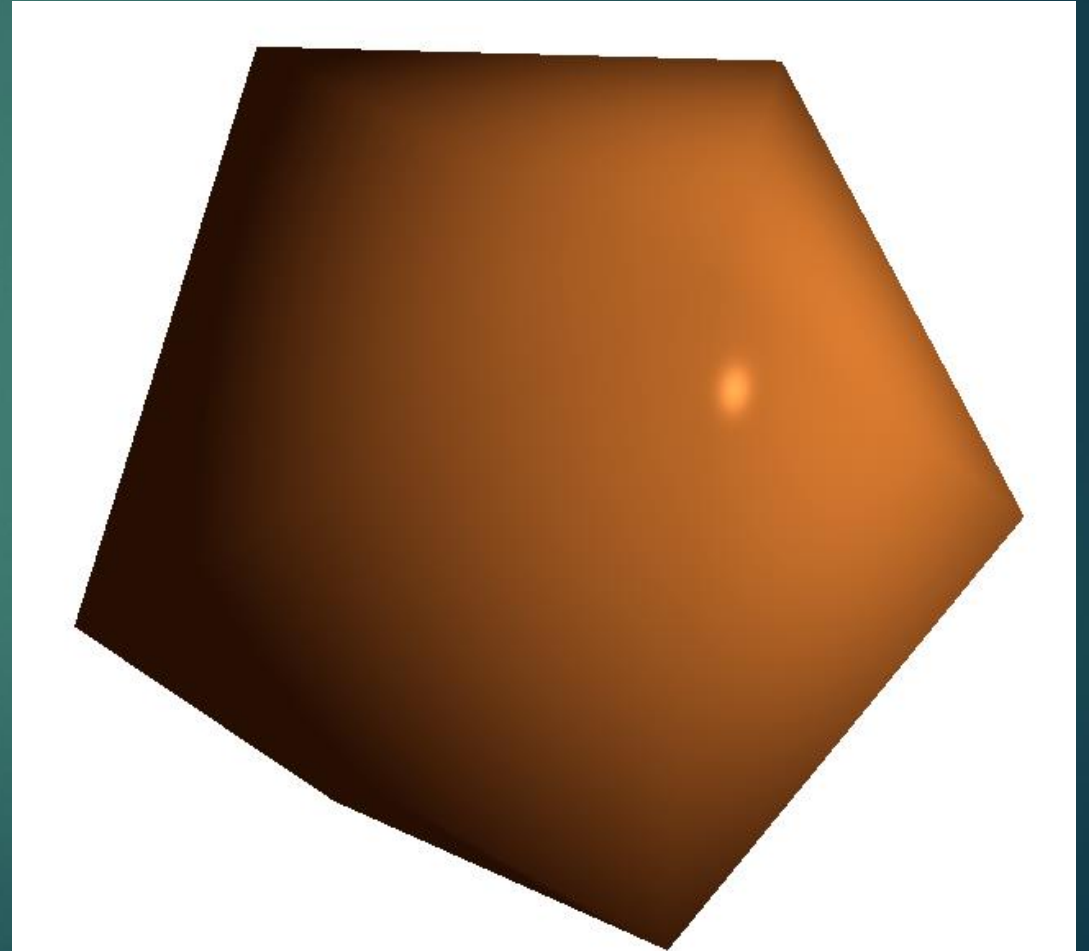
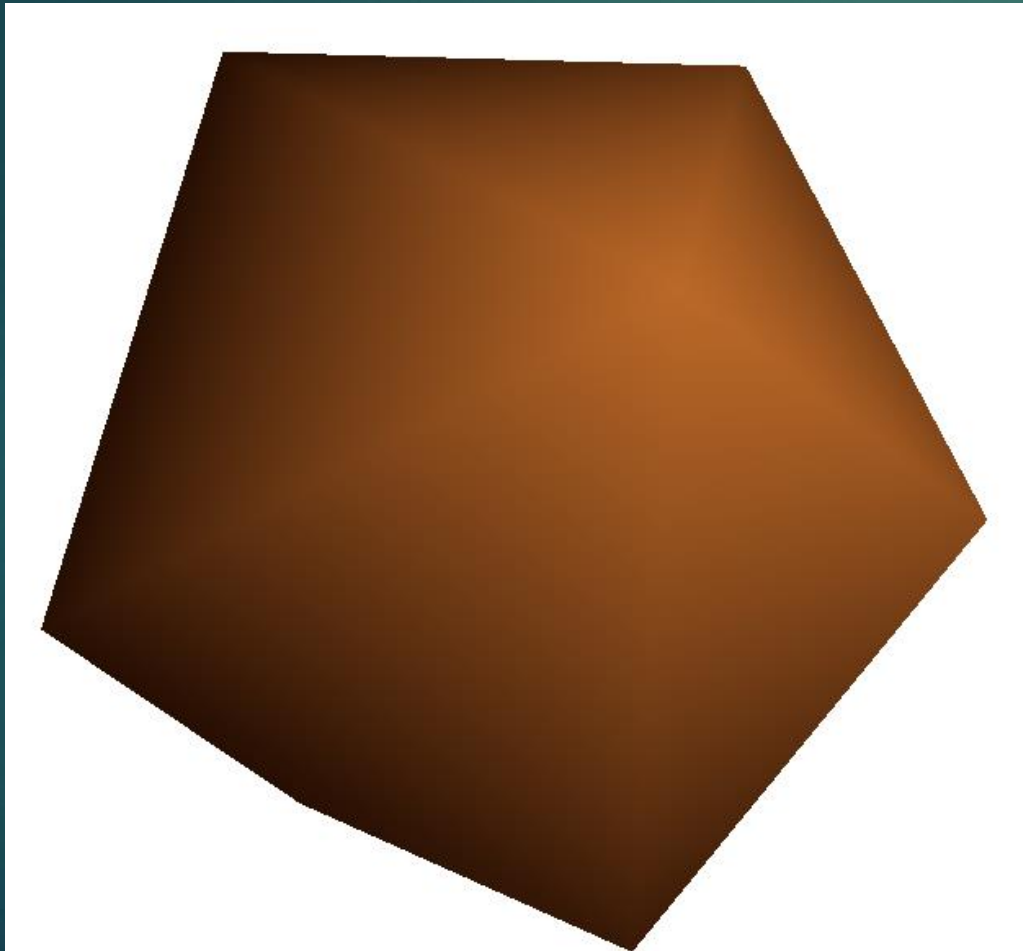
Diferença – Vértice / Fragmento

2 luzes - bronze



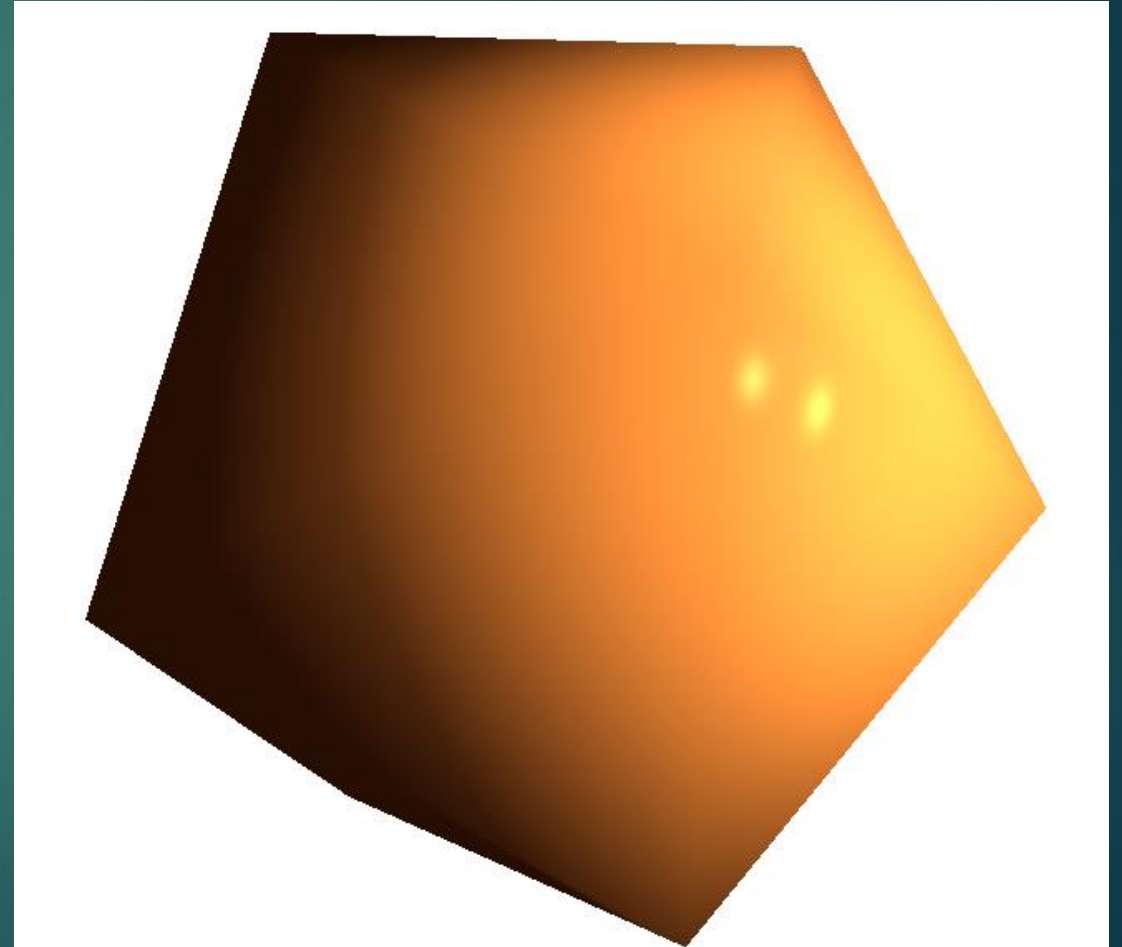
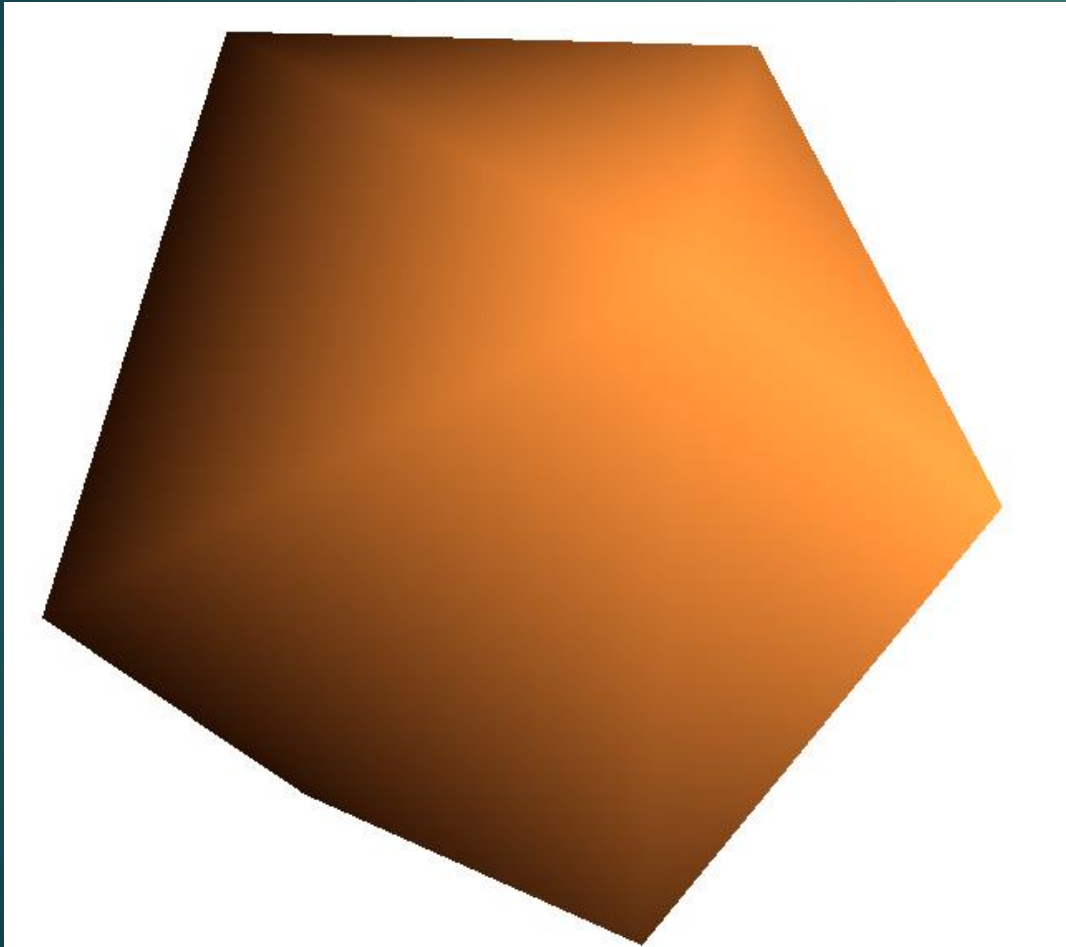
Diferença – Vértice / Fragmento

1 luz - bronze



Diferença – Vértice / Fragmento

2 luzes - bronze



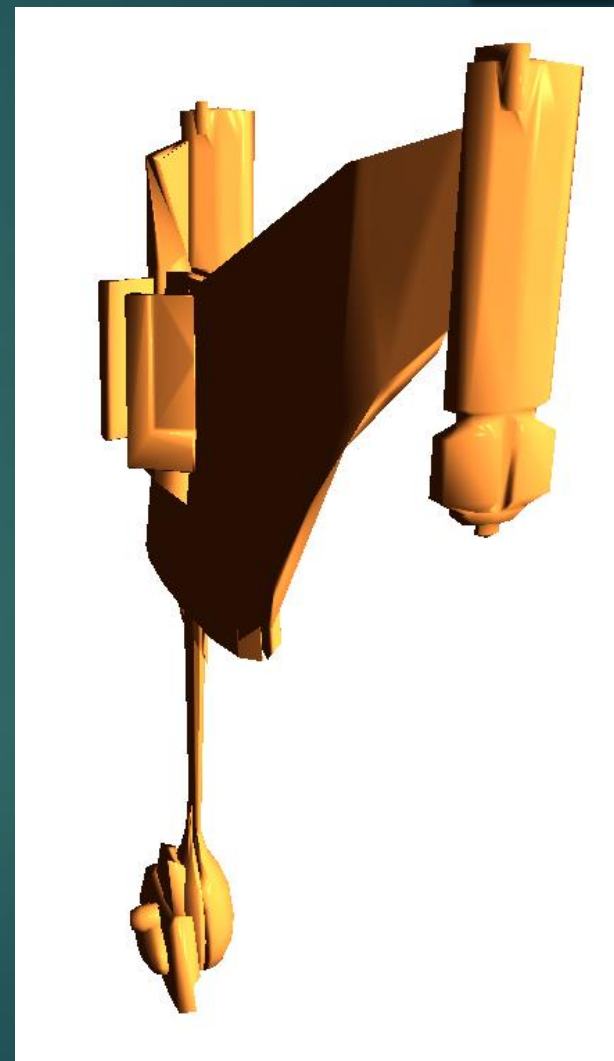
Comparação – Materiais
2 luzes – Iluminação por Fragmento



Plástico Preto



Marfim Preto



Bronze