

# Computer Graphics II

## - Blending (Questions)

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# Possible Questions

What is blending?

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- Blending: blend several colors (of different objects) to a single color (Transparency allows to see through objects)

# Possible Questions

How do you enable blending:

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```
glEnable(GL_BLEND);
```

# Possible Questions

How is the blending equation defined?

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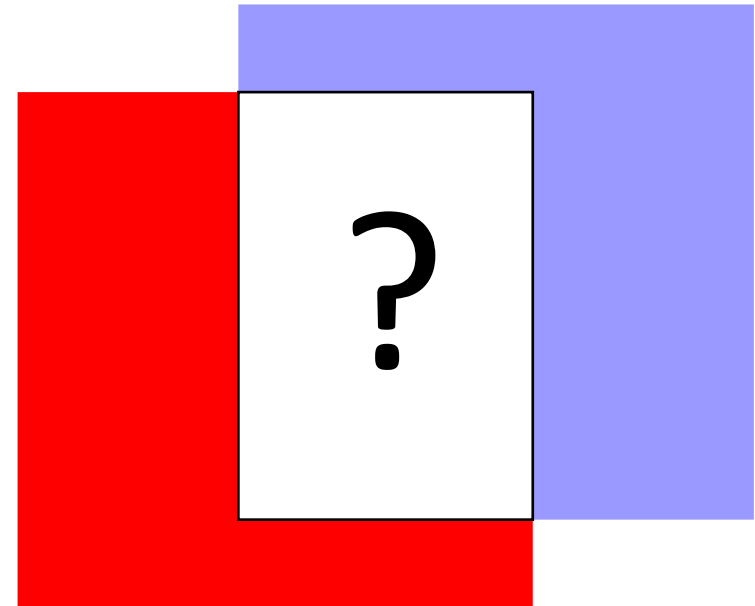
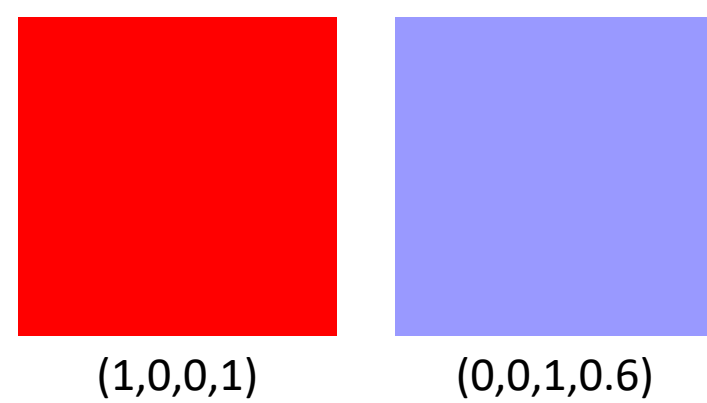
$$\bar{C}_{result} = \bar{C}_{source} \cdot F_{source} + \bar{C}_{destination} \cdot F_{destination}$$

- $\bar{C}_{source}$ : source color vector (originates from the texture)
- $\bar{C}_{destination}$ : destination color vector (currently stored in the color buffer)
- $\bar{F}_{source}$ : source factor value (impact of the alpha value on the source color)
- $\bar{F}_{destination}$ : destination factor value (impact of the alpha value on the destination color)

# Possible Questions

What is the final color?

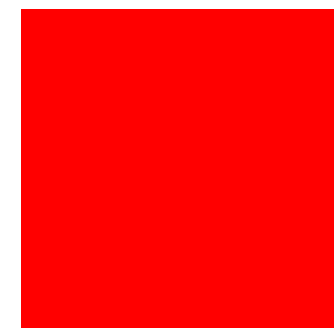
$$\bar{C}_{result} = \bar{C}_{source} \cdot F_{source} + \bar{C}_{destination} \cdot F_{destination}$$



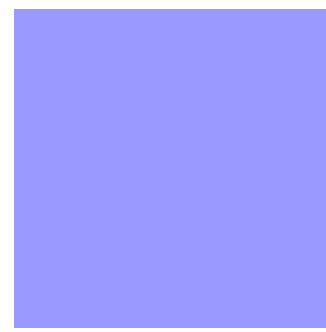


# Possible Questions

What is the final color?



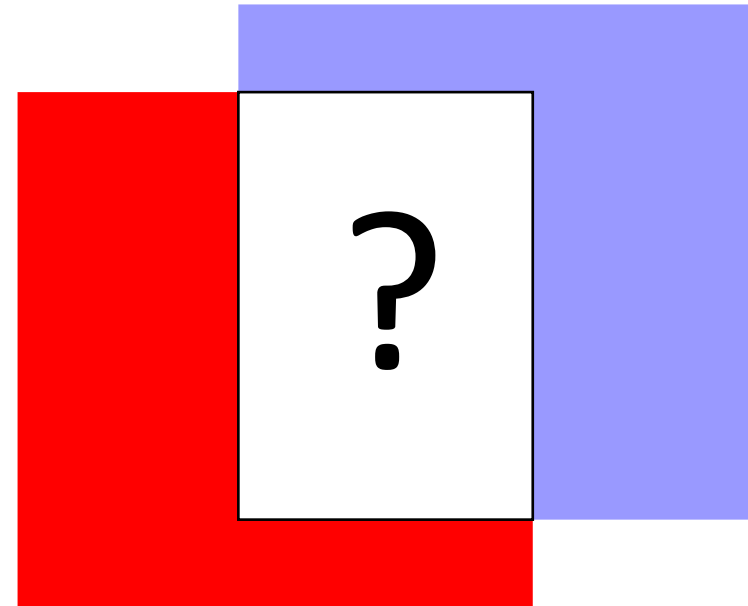
(1,0,0,1)



(0,0,1,0.6)

$$\bar{C}_{result} = \bar{C}_{source} \cdot F_{source} + \bar{C}_{destination} \cdot F_{destination}$$

$$\bar{C}_{result} = \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0.6 \end{pmatrix} \cdot 0.6 + \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix} \cdot (1 - 0.6) = \begin{pmatrix} 0.4 \\ 0 \\ 0.6 \\ 0.76 \end{pmatrix}$$



# Possible Questions

What is the meaning of `GL_ONE_MINUS_SRC_ALPHA`?

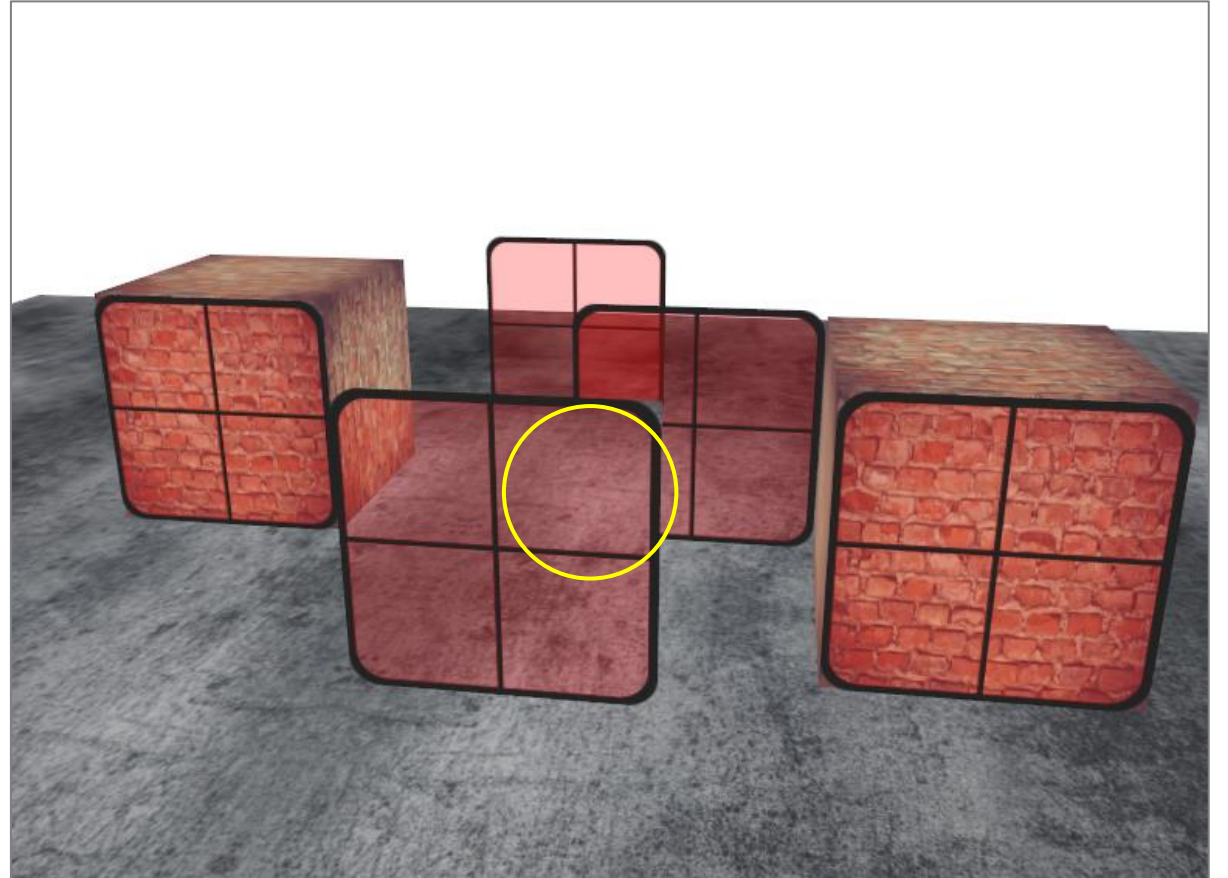
# Possible Questions

What is the meaning of GL\_ONE\_MINUS\_SRC\_ALPHA?

Factor is equal to  $1 - \alpha$  of the source color vector  $\bar{c}_{source}$ .

# Possible Questions

How can you handle this unwanted behavior?



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How can you handle this unwanted behavior?

When drawing a scene with non-transparent and transparent objects the general outline is usually as follows:

1. Draw all opaque objects first.
2. Sort all the transparent objects.
3. Draw all the transparent objects in sorted order.

# Possible Questions

What does that mean?

```
glCullFace(GL_FRONT);
```

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```
glCullFace(GL_FRONT);
```

- GL\_FRONT: Culls only the front faces