Project Question: How can we express connectivity?
Assume no connectivity change from \[ \begin{array}{c} \bullet \\ \bullet \end{array} \] to \[ \begin{array}{c} \bullet \\ \bullet \\ \bullet \end{array} \]?
How do you encode \[ \begin{array}{c} \bullet \\ \bullet \\ \bullet \\ \bullet \end{array} \] to \[ \begin{array}{c} \bullet \\ \bullet \\ \bullet \end{array} \]?
There are a lot of edges: \[ \begin{array}{c} \bullet \\ \bullet \\ \bullet \\ \bullet \\ \bullet \end{array} \] so that figure can be encoded to \[ \begin{array}{c} \bullet \\ \bullet \\ \bullet \\ \bullet \end{array} \].
Instead of multiple edges, you can just find each case to recover lost detail:
\[ \begin{array}{c} \bullet \\ \bullet \\ \bullet \end{array} \rightarrow \text{if } b \text{ and } f \text{ are combined, this becomes} \begin{array}{c} a, bf, c, d, e, bf, g \end{array} \text{. You can also tell each edge which split vertex it goes to.} \]

Shadows & Visibility:
- In many scenes, best savings are done by not rendering occluded parts.
- Visibility and shadows have parallels (replace the viewpoint with a light source).
- Most conservative “hidden” function: simply return 0
- We also need to count how many false positives.

Shadow & Visibility
- If we deduce an item is hidden, but 1 pixel is visible, is that error okay?
- You could precompute visibilities and when transitioning, play a video

From-point visibility pre-computation
- Compute object IDs instead of colors

Cherchez la lune
- Check if an edge intersects the ellipse (completely inside/outside)
- Check if a point is inside the triangle

A triangle appears clockwise
- Collision, coplaner, volume of tetrahedra using the same formula. The sign is CW/CCW

Is a moon hiding a triangle?
- Two vertices in a ball have an edge still contained by the ball (the ball is convex)
- If a shape is convex or a vertex is outside, then it is occluded

Non-convex occluders
- Find a convex shape – The bigger they are, the more occluding power
- Occluders can be surfaces, not volumes if everything appears convex.
- Shoot three rays, which tell that the points are hidden