A1—Soft Shadows

Due: Friday February 7th, at 7am

1. Write GPU shaders to render soft shadows for a scene with two boxes moving on a ground plane, and a moving rectangular light source.
   a. The boxes do not intersect
   b. The shadows of the boxes should intersect
   c. Soft shadows should be computed by estimating visibility to 16x16 light samples; visibility should be estimated by ray tracing; the ground plane and the two boxes are provided to the GPU as uniform parameters
2. Make a 30s video illustrating your assignment.
   a. The view should be stationary and chosen to show the three boxes and the relevant part of the ground plane
   b. First the light source should be stationary and the boxes should move
   c. Then the light source should grow and shrink and the boxes should not move
3. Extra credit 5%: carve the box surfaces with the help of two "stencil" textures that you design
   a. One texture is to be used for the top face of the boxes
   b. The other texture is to be used for the side faces of the boxes
   c. The texture should have white and black pixels; white means "hole", that is "absence of material"; black means "solid", that is "presence of material"
   d. The top texture should be continuous with the lateral texture at all four of its sides
   e. Update your shaders to carve the boxes using the two textures; shadow computation should account for the modified geometry of the surfaces of the boxes
   f. Illustrate the extra credit feature with a 30s video as described at point 2 above
4. Turn in via blackboard one zip archive that contains
   a. Source code
   b. Executable
   c. Video file