Objectives

o   Understand sampling for area lights.

Step 1: Composite Shape Light Source （12 pts）

Area lights are light sources defined by one or more Shapes that emit light from their surface, with some directional distribution of radiance at each point on the surface.
In general, computing radiometric quantities related to area lights requires computing integrals over the surface of the light that often can't be computed in closed form.
This issue is addressed by the Monte Carlo integration techniques. Despite the added complexity and computational cost, the use of area lights creates soft shadows and more realistic lighting effects, rather than the hard shadows and stark lighting that come from point lights.

- In this lab, your task is to create a composite shape light source, meaning taken the composite shape as the light source.

- In order to properly use composite shape as area lights, it is necessary to be able to compute the surface area of a shape in object space. But you can use addition of all individual shape's surface area as an approximation. Note this will introduce some errors for Monte Carlo integration.

- Another function needs to implement for the composite shape class is the Sample() class, which we ignore in lab2.

- Create a scene that use the composite shape as the area light source.

- The scene file should look like this:

```
AttributeBegin
AreaLightSource "area" "color L" [50 50 50]  # adjust based on your needs
# adjust light source position here
Shape "your_composite_shape"
```

AttributeEnd

- PBRT only implements the `Sample()` method for several shape classes. If your composite shape includes elements lacking a `Sample()` method, you are encouraged to switch those elements to alternative shapes that support this method.

- This link helps understand the sample function: [Sampling Light Sources](#)

Step 2: Submission

What to submit, a zip file contains:
- Any modified source code for step 1, including api.cpp, etc.
- Your scene file and rendered image for step 1.
- Include a README detailing the location within the source code where your files should be added. Ensure that the original source code, along with the code you've submitted, is compilable.