

# Programming Assignment #5

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- Simple ray tracer
  - You are required to implement a simple ray tracer
- Required features
  - Ray tracing spheres [10 points]
  - Ray tracing polygons [10 points]
  - Recursive reflection [10 points]
  - Recursive refraction [10 points]
  - Phong illumination [10 points]
  - Export image files [10 points]
  - Texture mapped spheres and polygons [10 points]
  - Report [15 points]
  - Representative pictures [15 points]

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- Hand in all “nice” images you generated
  - Generate a pair of OpenGL-rendered and raytraced images at the same view point
  - You may need to use an image library
    - e.g., PIL (Python Image Library)
- Your report should explain
  - What features you implemented
  - Which image is demonstrating which features
  - Instructions to render submitted images
- Features that are not demonstrated in images will receive little or no credit

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- Extra features (up to 30 points)
  - Distributed ray tracing
    - Soft shadows, depth of field, and motion blur
  - Spatial partitioning
    - Uniform cell subdivision, octrees, or BSP trees
    - Need to demonstrate performance improvements
  - Bump and/or displacement mapping
  - GPU implementation