

Coding Deliverables

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1. Done
2. Done
3. box.cpp, plane.cpp, render_world.cpp, sphere.cpp
4. Debug_Scope is in misc.h
5. "small_t" is contained in object.h
6. You can run the program using the -s flag and specify the solution image
7. A diff.png is generated which shows any differences between two images in a single image
8. The Object member function "Intersection" should return a Hit object whose dist member is negative.
9. The Box member function "Union" should return another box which is as small as possible while also containing the current box and the parameter box.
10. The "all_objects" variable is declared in render_world.h as a member variable of the Render_World object. Its purpose is to store the pointers to all the objects in the world for deallocation only.
11. The "componentwise_min" function in vec.h compares two vectors element by element to create a new vector where each element is the smallest between the two input vector's element.

- ```
[cs130 container hmala001@xe-04 1]$ scons
scons: Reading SConscript files ...
scons: done reading SConscript files.
scons: Building targets ...
g++ -o box.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 box.cpp
g++ -o camera.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 camera.cpp
g++ -o dump_png.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 dump_png.cpp
g++ -o flat_shader.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 flat_shader.cpp
g++ -o main.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 main.cpp
g++ -o parse.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 parse.cpp
g++ -o plane.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 plane.cpp
g++ -o sphere.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 sphere.cpp
g++ -o registration.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 registration.cpp
g++ -o render_world.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 render_world.cpp
g++ -o ray_tracer -L/usr/local/lib sphere.o registration.o camera.o render_world.o dump_png.o parse.o plane.o box.o flat_shader.o main.o -lpng
scons: done building targets.
12. [cs130 container hmala001@xe-04 1]$
```

```
[cs130 container hmala001@xe-04 1]$ python ./grading-script.py 2
scons: Reading SConscript files ...
scons: done reading SConscript files.
scons: Building targets ...
g++ -o box.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 box.cpp
g++ -o camera.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 camera.cpp
g++ -o dump_png.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 dump_png.cpp
g++ -o flat_shader.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 flat_shader.cpp
g++ -o main.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 main.cpp
g++ -o parse.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 parse.cpp
g++ -o plane.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 plane.cpp
g++ -o render_world.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 render_world.cpp
g++ -o registration.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 registration.cpp
g++ -o sphere.o -c -std=c++17 -g -Wall -O3 -I/usr/include/libpng12 sphere.cpp
g++ -o ray_tracer -L/usr/local/lib box.o render_world.o main.o plane.o registration.o sphere.o
scons: done building targets.
FAIL: could not open grading scheme.
[cs130 container hmala001@xe-04 1]$
```

13.