

Assignment 1: Report

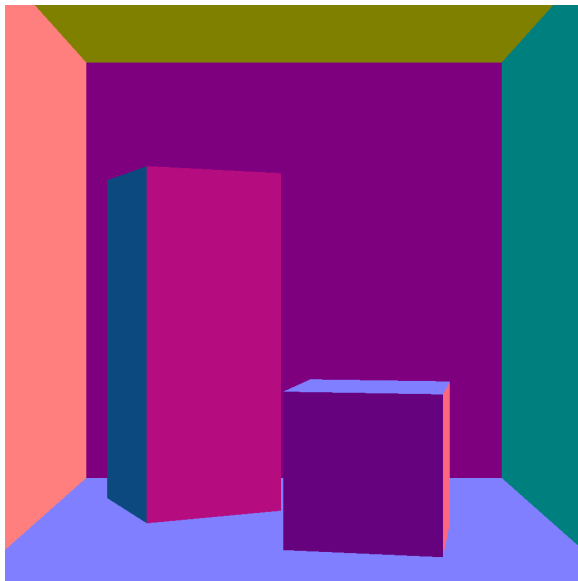
Shreyash Jain (2020101006)

Question 1

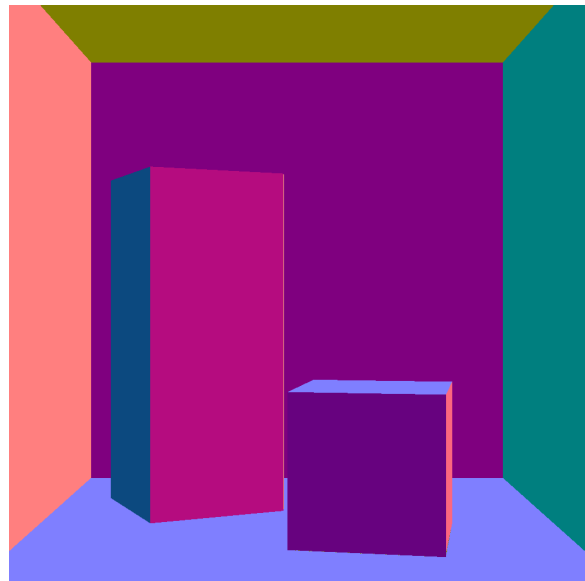
This discrepancy occurred because of the precision error in `C++`. If we subtract a float with a big value before the denominator with a number which has a big number after the denominator, it gets rounded off.

The `vector3f` used in the code is a float vector. So changed that to a vector with `double` data type elements did the trick.

`correct.json`



`incorrect.json`



Question 2

Usage: `./build/render <scene_path> <output_path> <intersection_variant>`

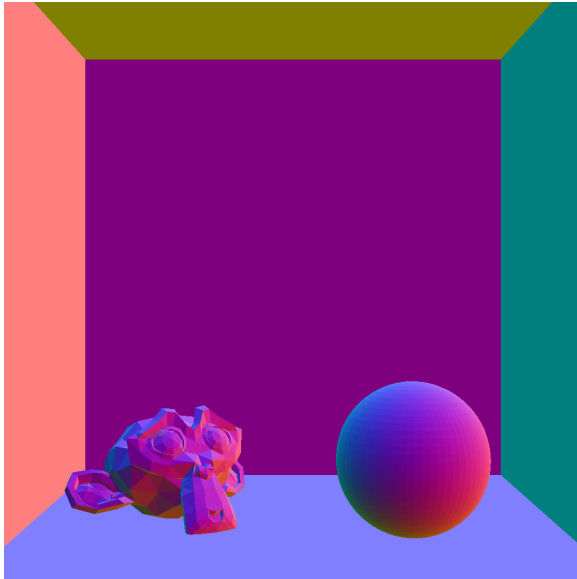
Naive intersection

Cornell Box Hi

Time: `58s`

Cornell Box Lo

Time: `15s`



Donuts

Time: 19s

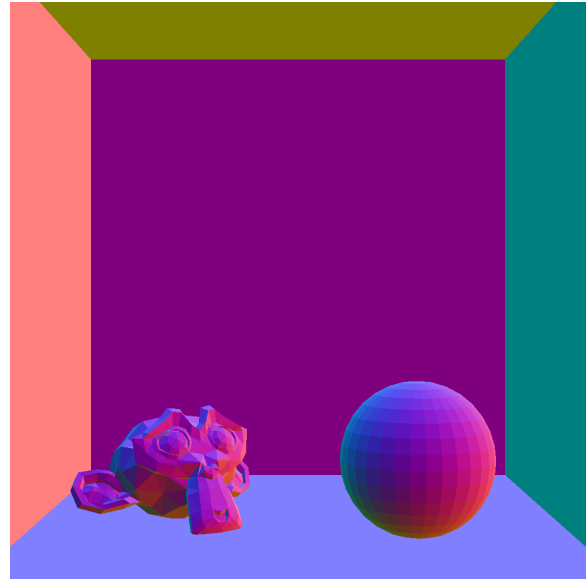
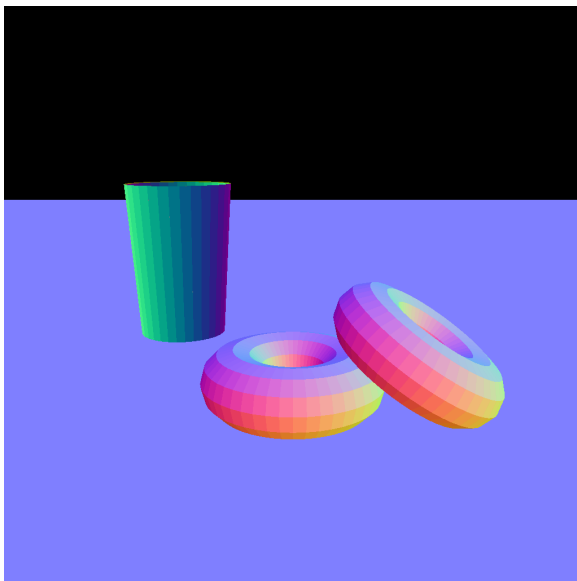


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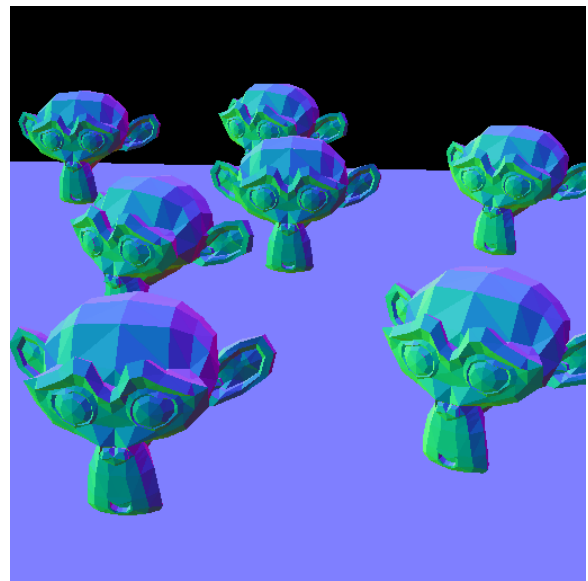
Time: 16s



AABB intersections

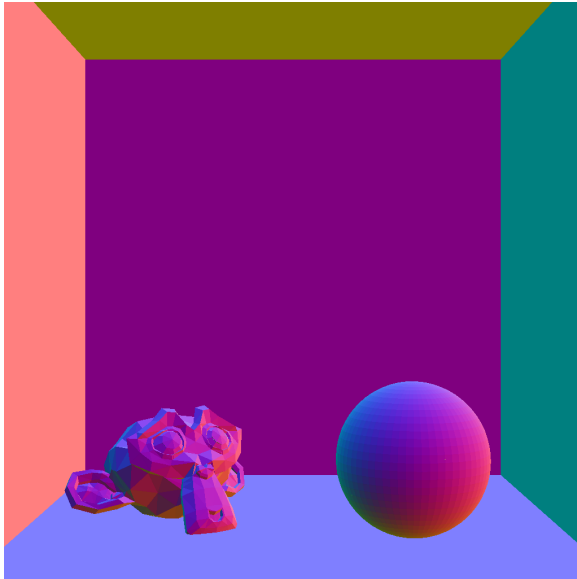
Cornell Box Hi

Time: 5.1s



Cornell Box Lo

Time: 1.5s



Donuts

Time: 2.4s

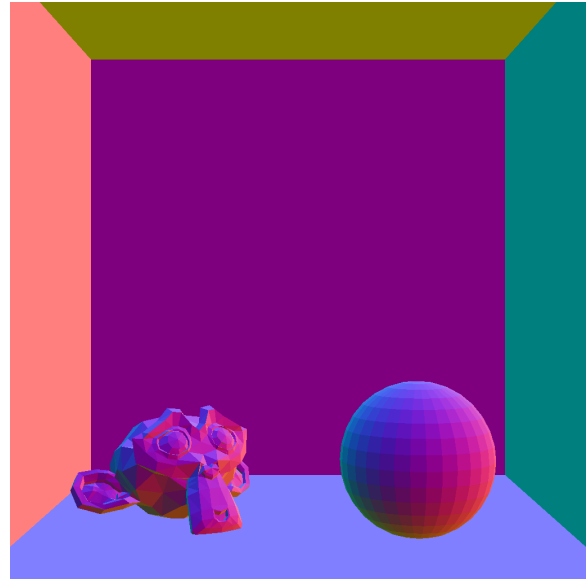
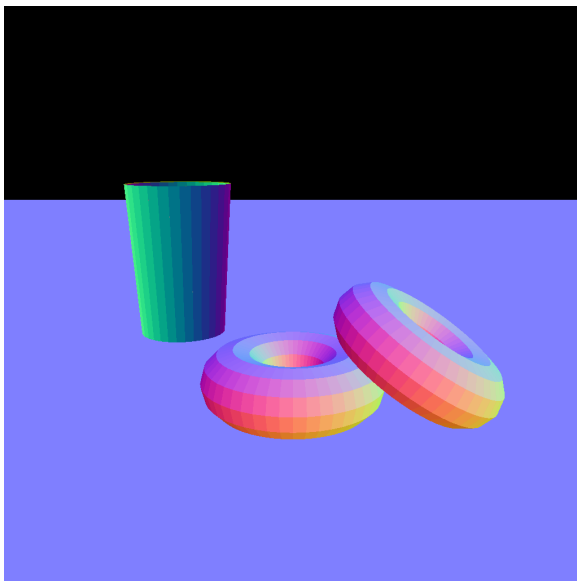


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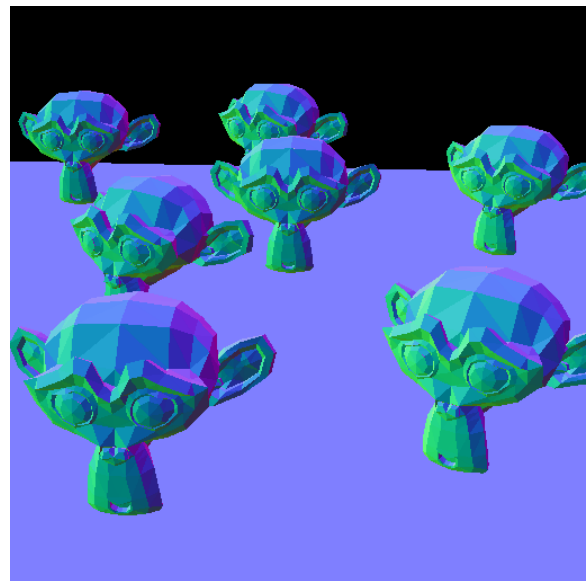
Time: 1.4s



BVH on AABB

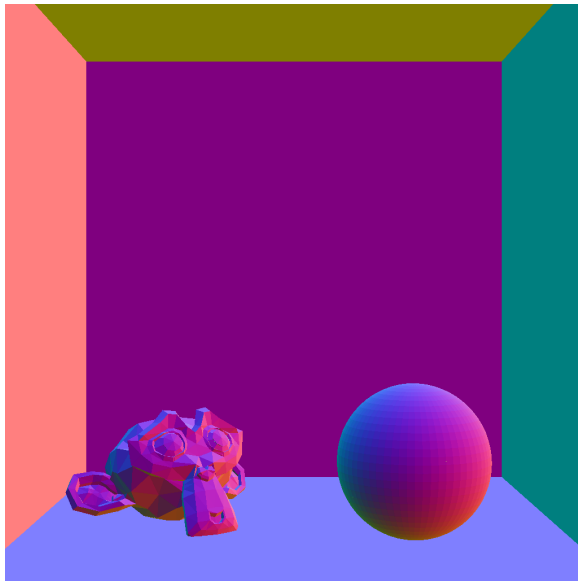
Cornell Box Hi

Time: 5.4s



Cornell Box Lo

Time: 1.5s



Donuts

Time: 2s

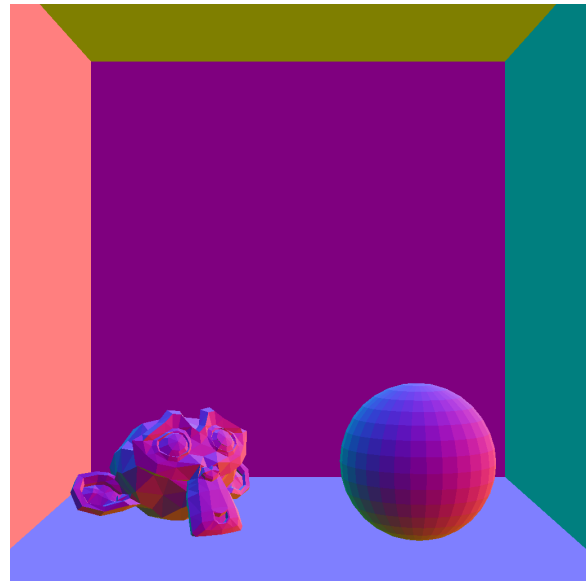
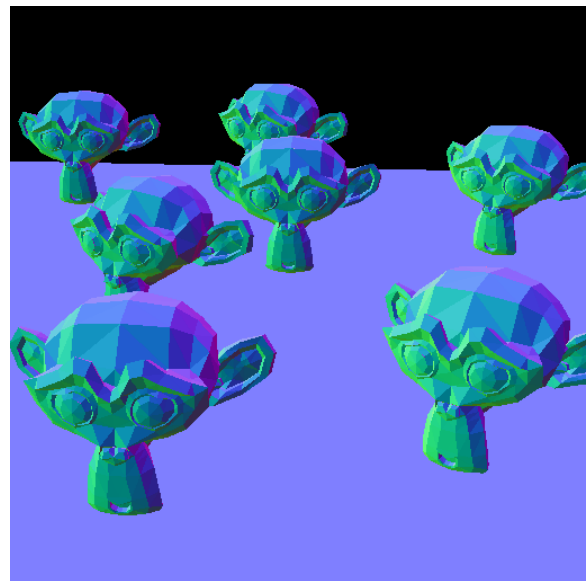
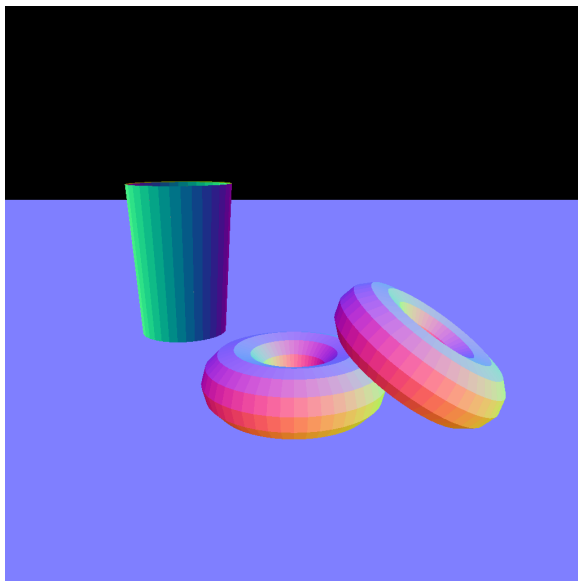


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Time: 1.3s



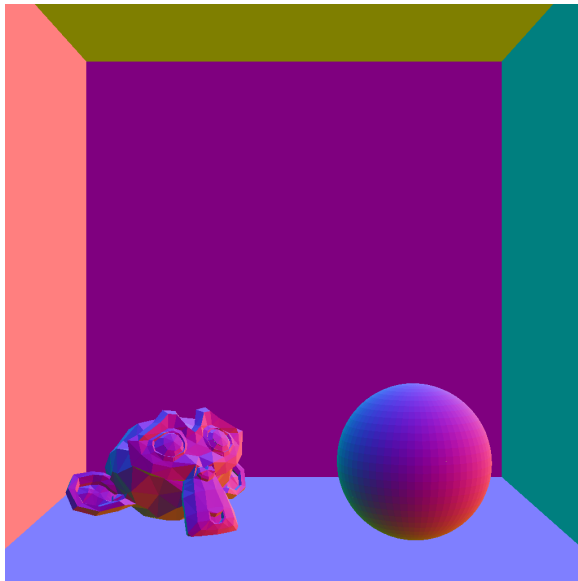
BVH on Triangles

Cornell Box Hi

Time: 0.4s

Cornell Box Lo

Time: 0.4s



Donuts

Time: 0.5s

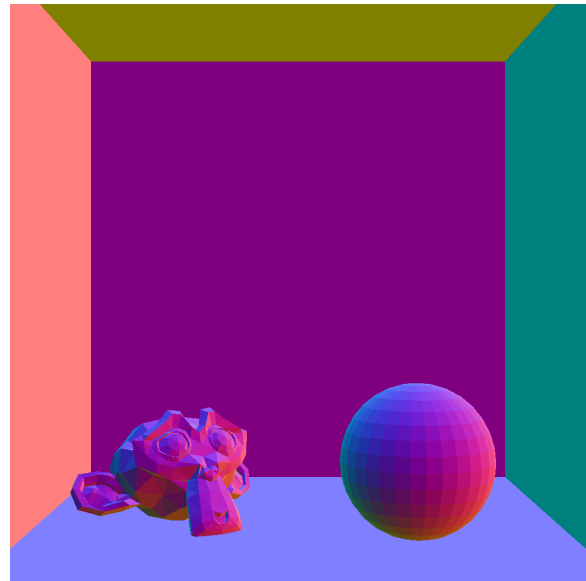
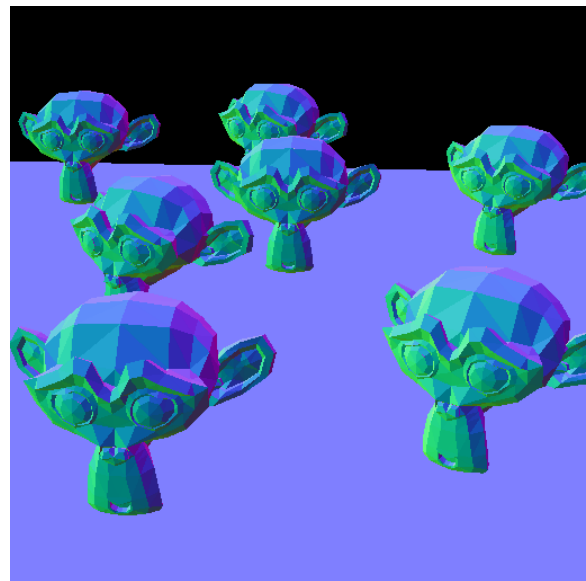
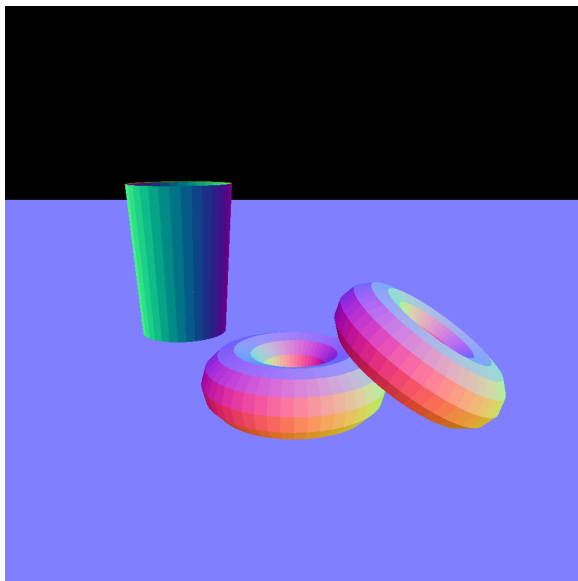


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Time: 0.2s



Results

	Naive	AABB	BVH Surface	Two Level	Speedup
Cornell Box Hi	58s	5.1s	5.4s	0.4s	145
Cornell Box Lo	15s	1.5s	1.5s	0.4s	37.5
Donuts	19s	2.4s	2s	0.5s	38
Table Top	16s	1.4s	1.3s	0.2s	80