Quiz 6 Leaves and Bounds

Logan Wan (lwan)

Part 1

Desert: Quad tree, since the scene geometry is relatively simple, and quad trees can better localize the car in the image than a regular grid.
Rice: Regular grid, since the bowl takes up a majority of the space of the image, and no finer resolution spatial information or hierarchy is necessary.
Savannah: BVH, so we can capture the multi-hierarchical representation of the data. (tree - elephants - grass - background).

Part 2

```
void distance( BSHNode n*, // node of interest
               Vector3D p, // query point
               double* d ) // smallest distance seen so far
{
    double pt_sphere_dist;

    if (!isLeaf) {
        // If not leaf, measure distance of probe to each child center
        double d2child1 = euclidean_dist(p, n.child1.center);
        double d2child2 = euclidean_dist(p, n.child2.center);

        if (d2child1 > d2child2) {
            // If closer to child2, skip child1
            distance(n.child2, p, d);
        } else {
            // Vice versa
            distance(n.child1, p, d);
        }

    } else {
        // If leaf, go through primitives and update smallest
        for (int ii; ii < nPrimitives; ++ii) {
            // using like vector
            double thisdist = n.primitives[ii].distance(p);
            if (thisdist < d) {
                d = thisdist;
            }
        }
    }

}
```