1. Mathematics

Before any real work can be done, it is important to develop a strong linear algebra and geometry library. This section skims over the details, as many tools can be used to implement a linear algebra library, but there are some necessities that our implementation depends upon, so we specify the implementation details that are required by the reset of the system.

For `C++` a library that implements almost all of the requirements is `glm`[1]. Although if one uses this, it is important to be careful with the different types of vectors, and template overloading can lead to unexpected issues.

1.1. **Real Numbers.**

The first component to implement is the real number type. The real number type (or floating point type) defines the maxim accuracy of the renderer. For example if the floating point type can only guarantee three digits of precision, then any computations will have relatively large errors. We will implement this type called `Float` like so.

[1] https://github.com/g-truc/glm