

Currents: Coding with Cinder

Week 4: Memory Management / Particle System Revisited

Instructors

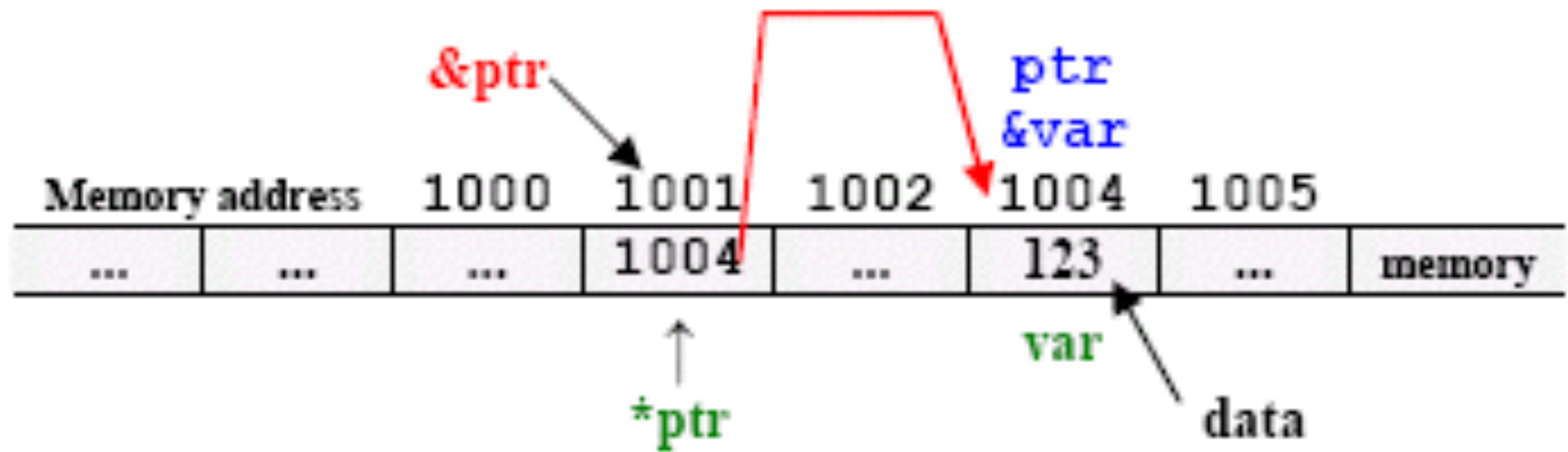
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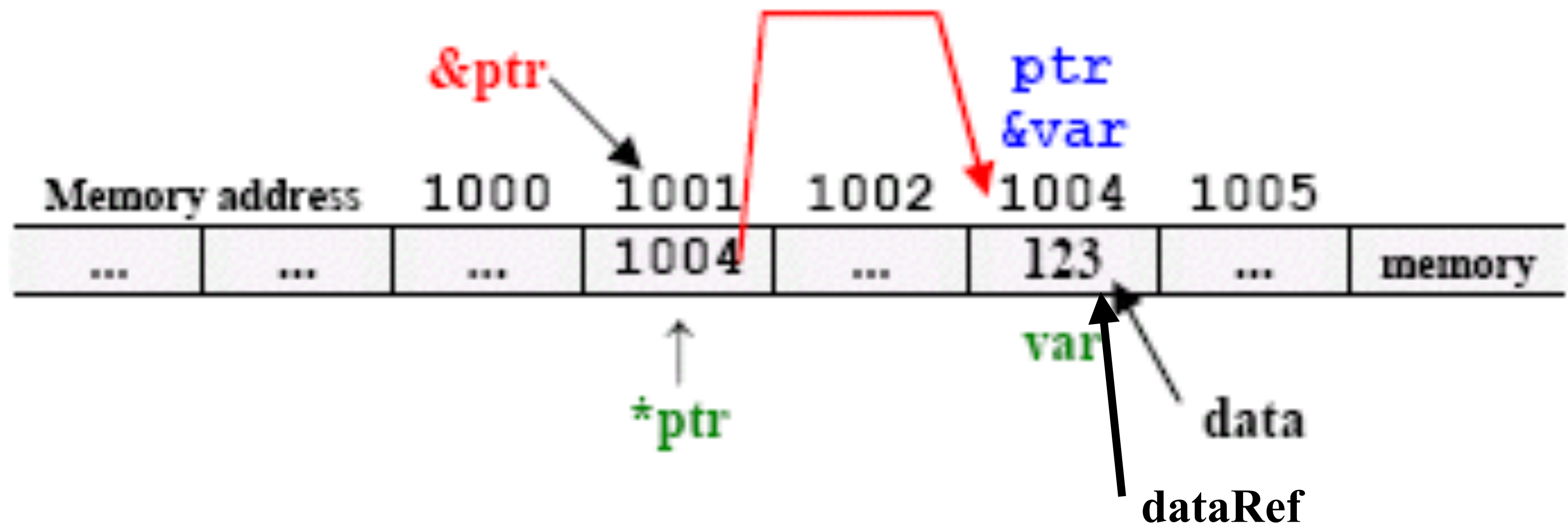
Memory Management

The glory of being a C++ programmer. And the price you pay to one.



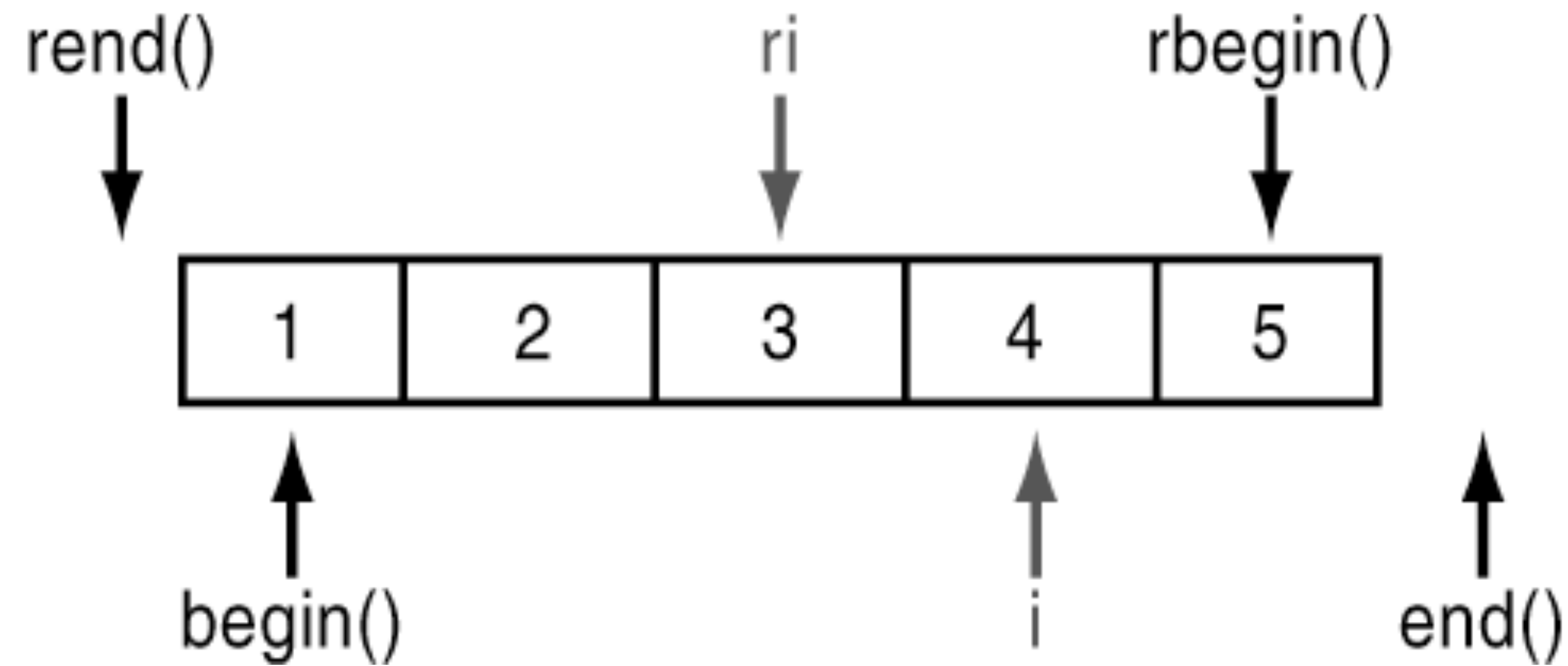
Pointer

A pointer stores the memory address of the object it points to.



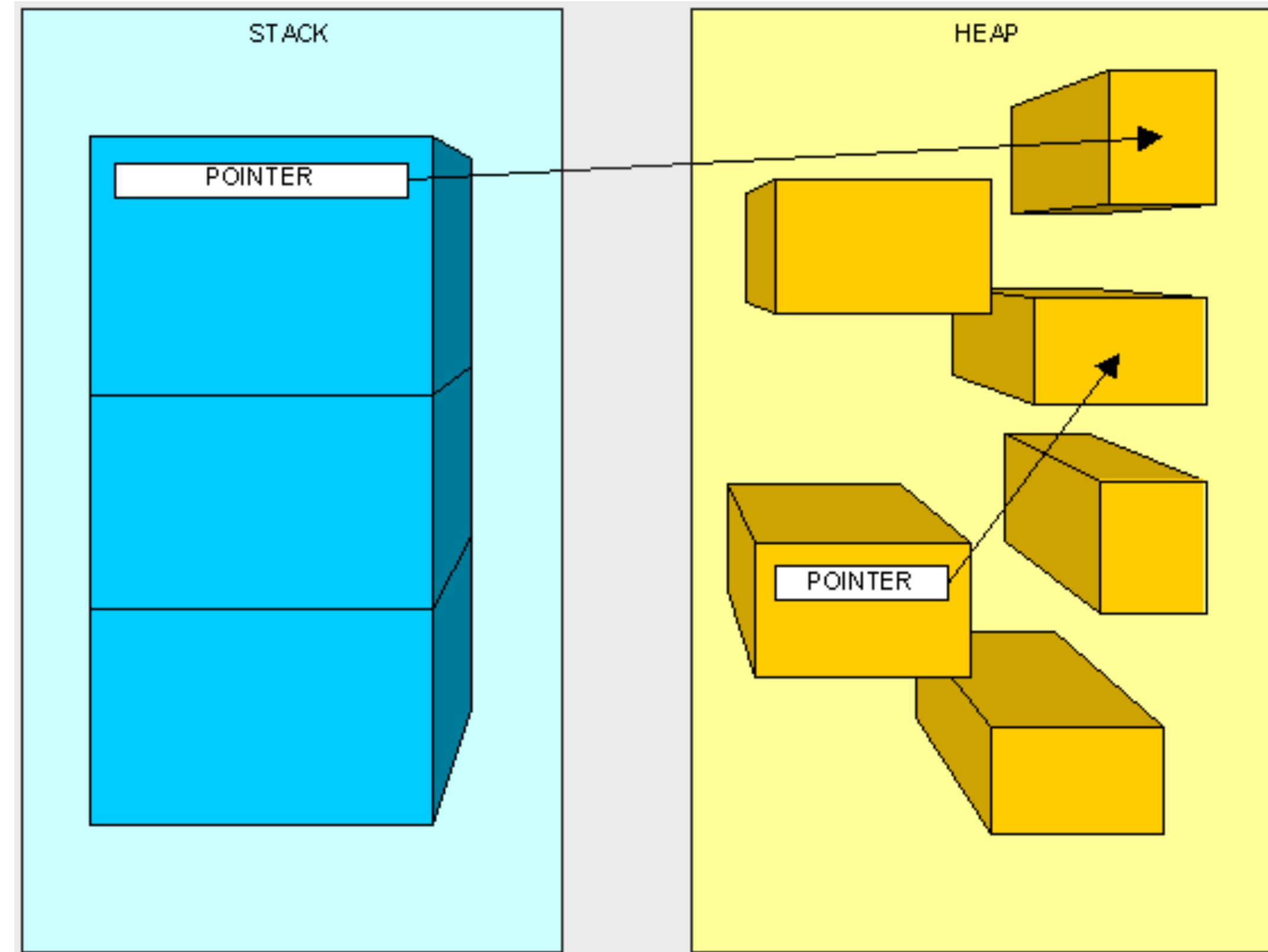
Reference

A reference is an alias of the object it refers to.



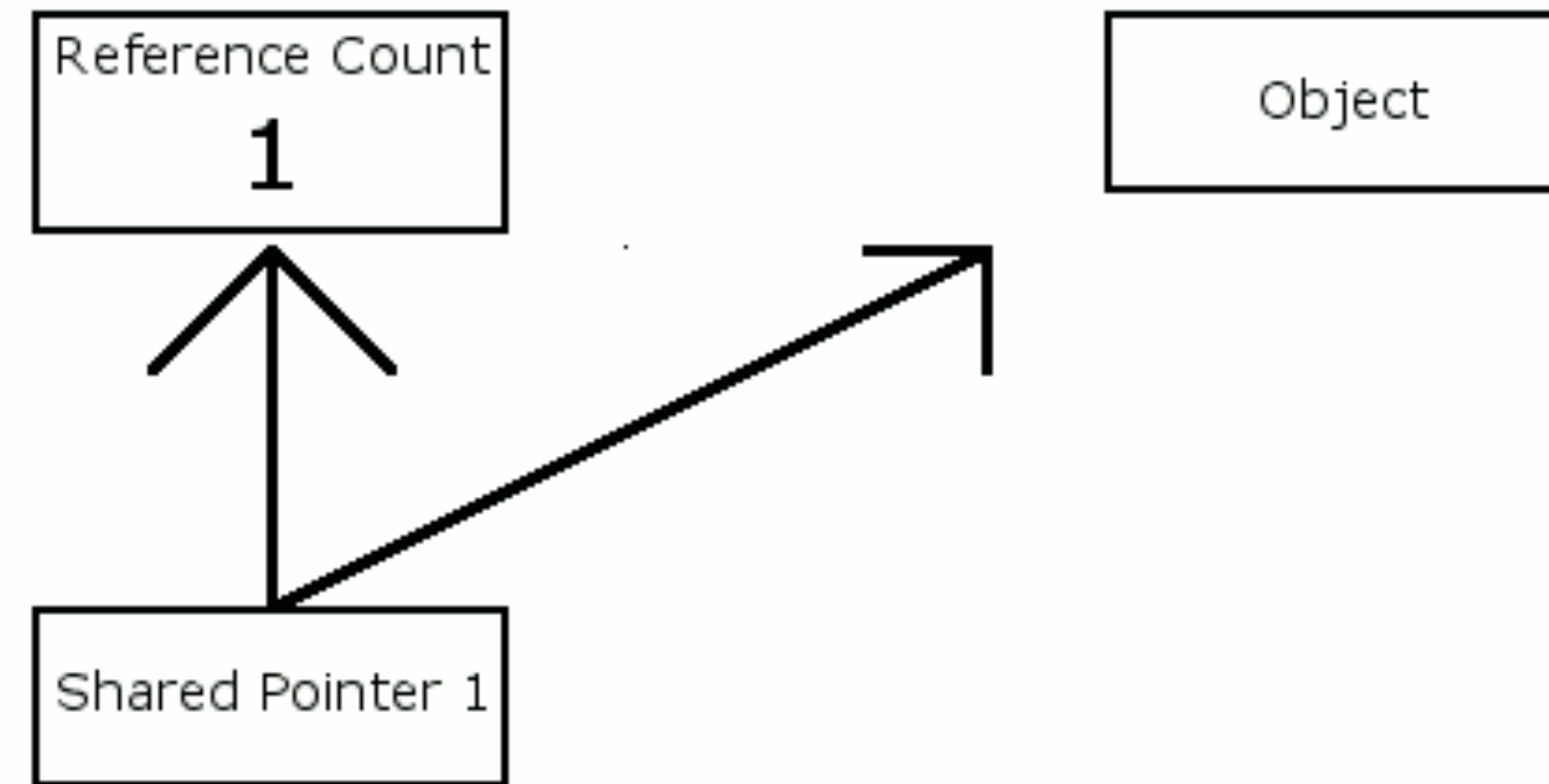
Iterator

Iterators behave like pointers, indicating addresses within a container.



Dynamic Memory

Memory in your C++ program is divided into two parts: the **stack** for local variables and the **heap** for dynamically created objects.



Object is allocated along with the reference count, which is initialised with a value of 1.

Shared Pointer

Shared pointer automatically manages dynamic allocated memory using reference counting.

How to use iterators.

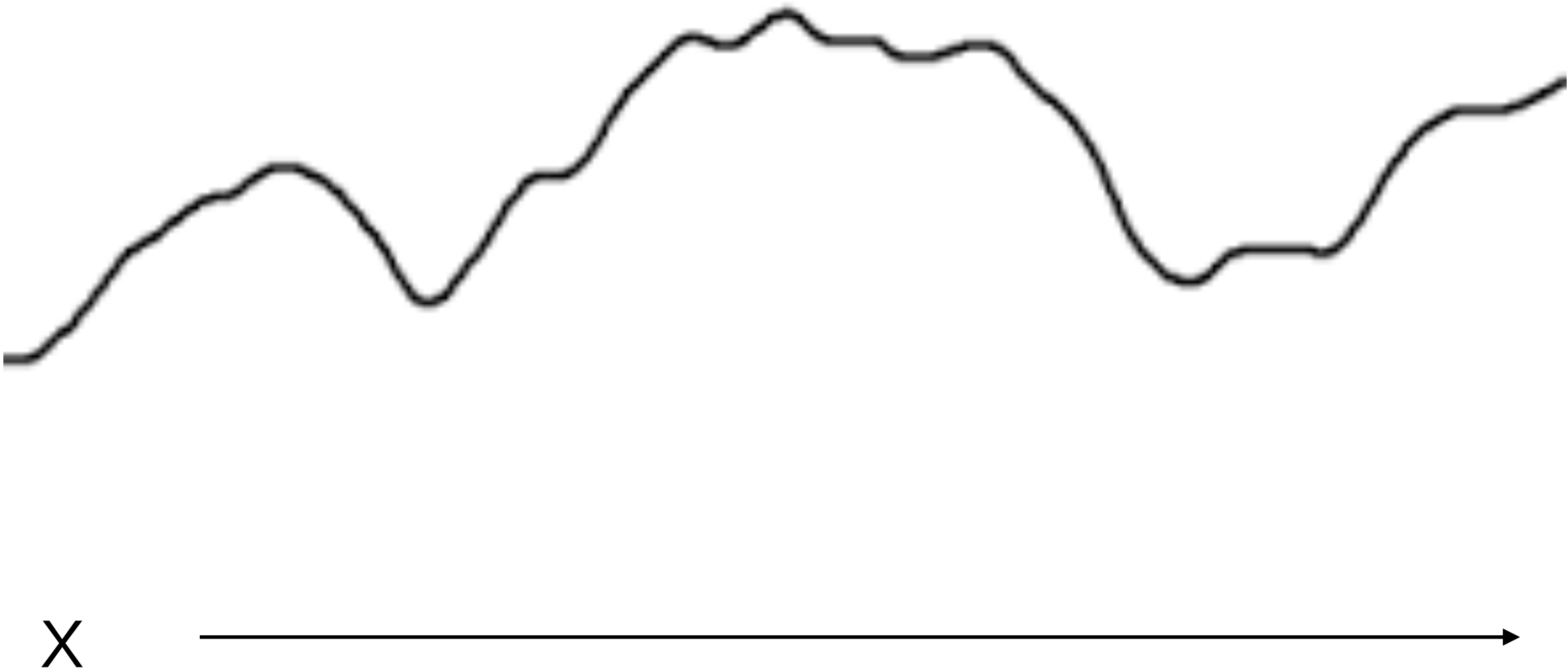
<https://stackoverflow.com/questions/14373934/iterator-loop-vs-index-loop>

<https://www.gogo-robot.com/2012/03/24/memory-management-part-2/>

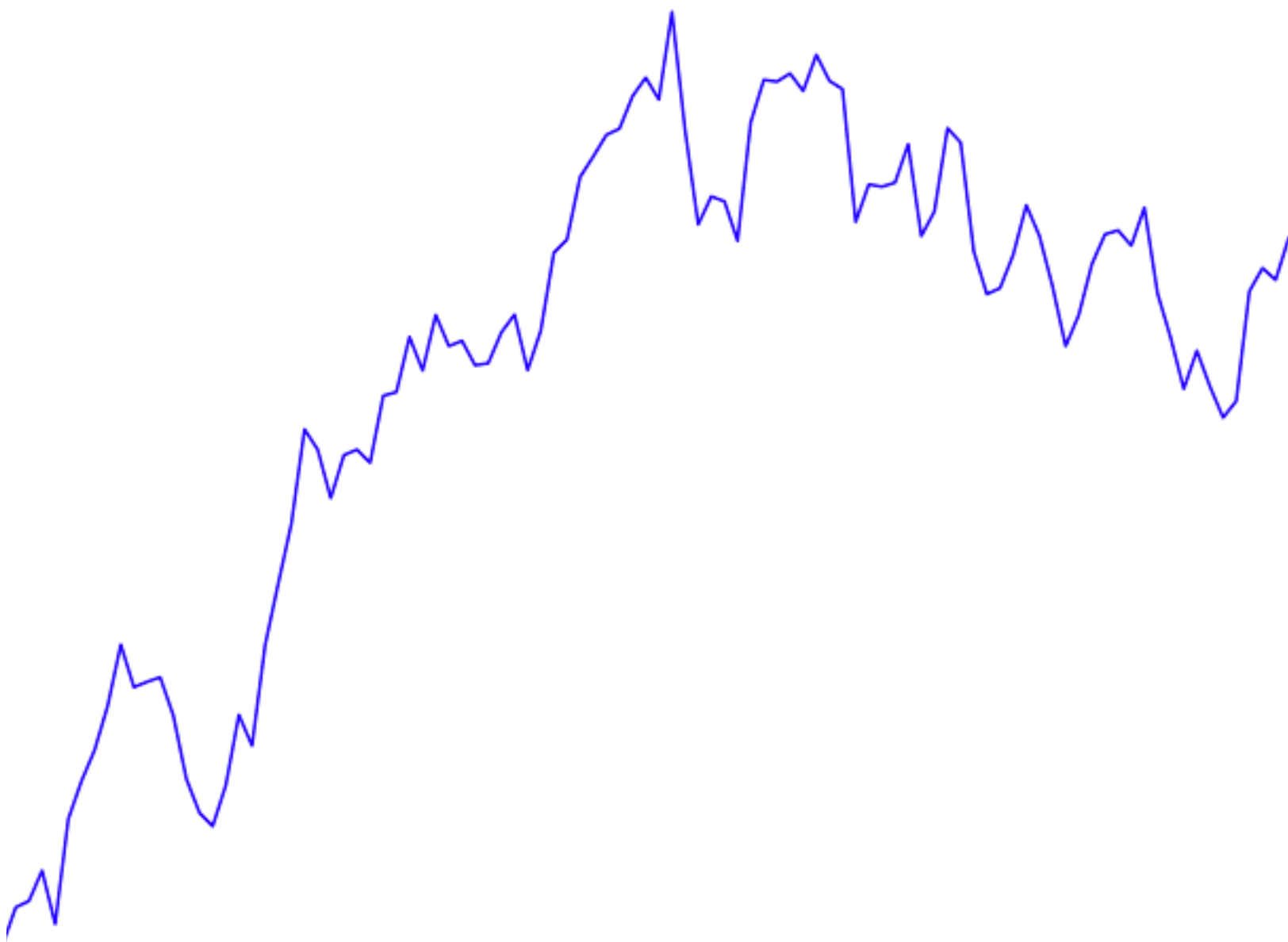
Perlin Noise

Perlin Noise is an extremely powerful algorithm that is used often in procedural content generation.

Noise



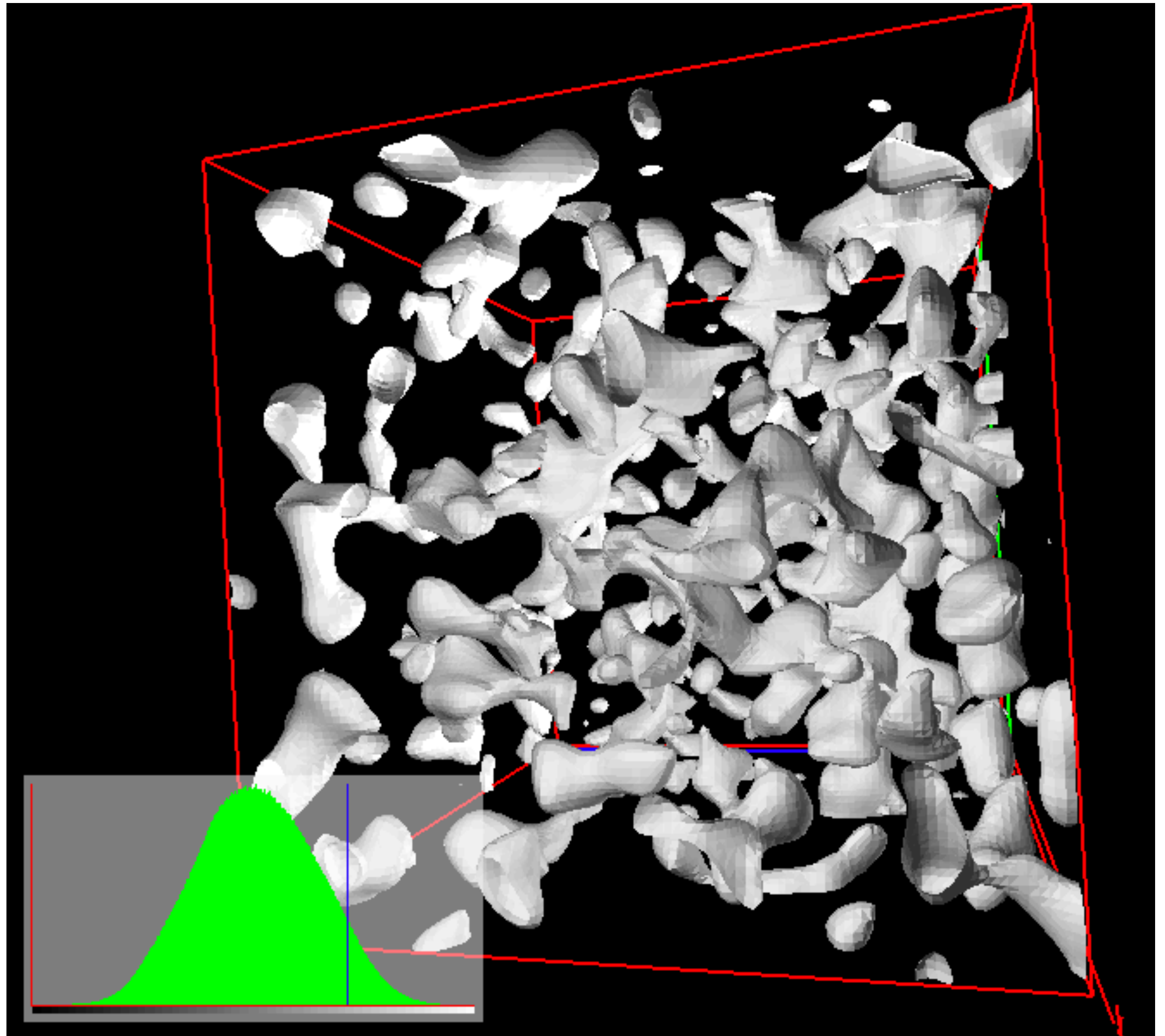
Random



2D Noise

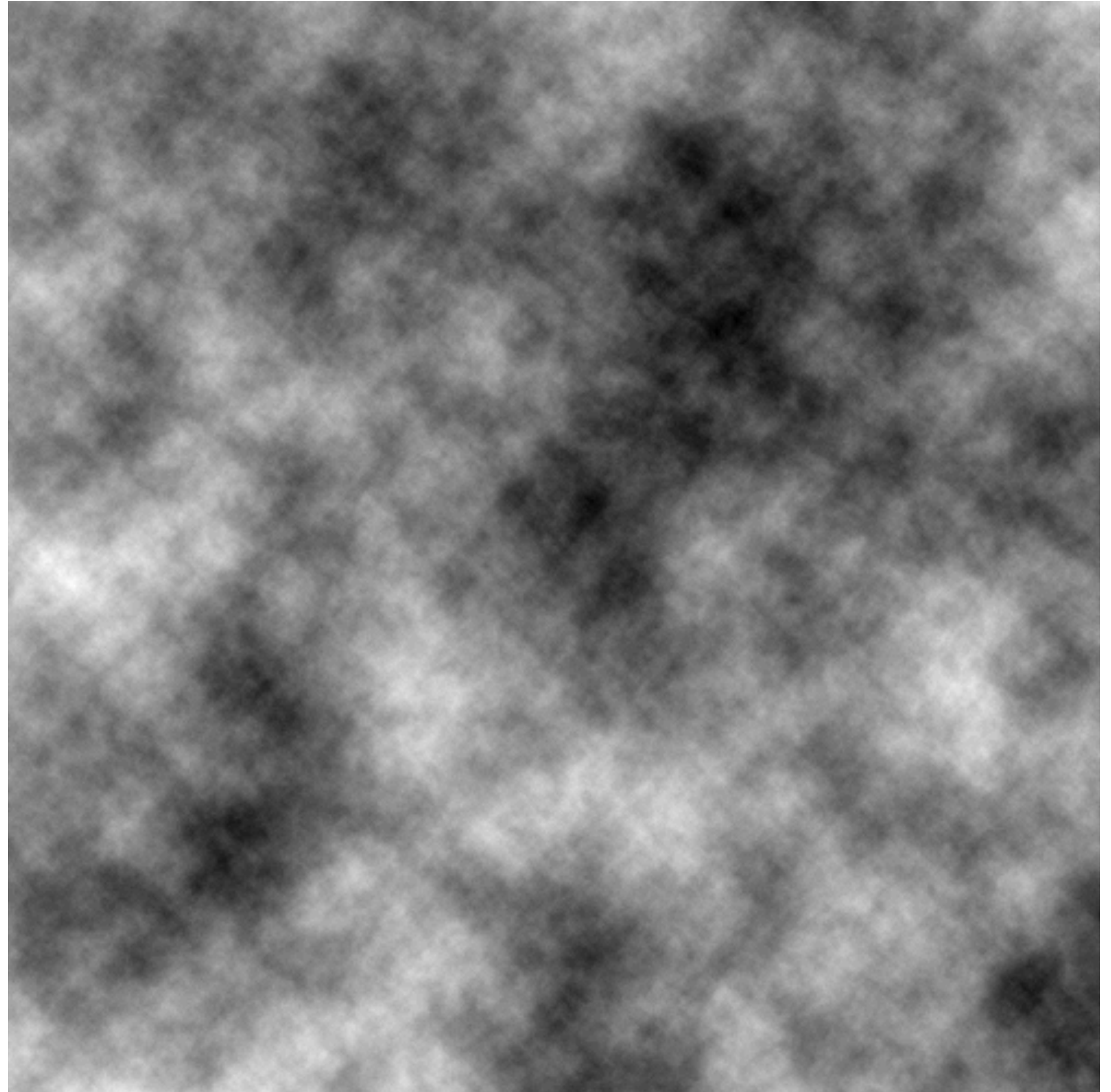


3D Noise



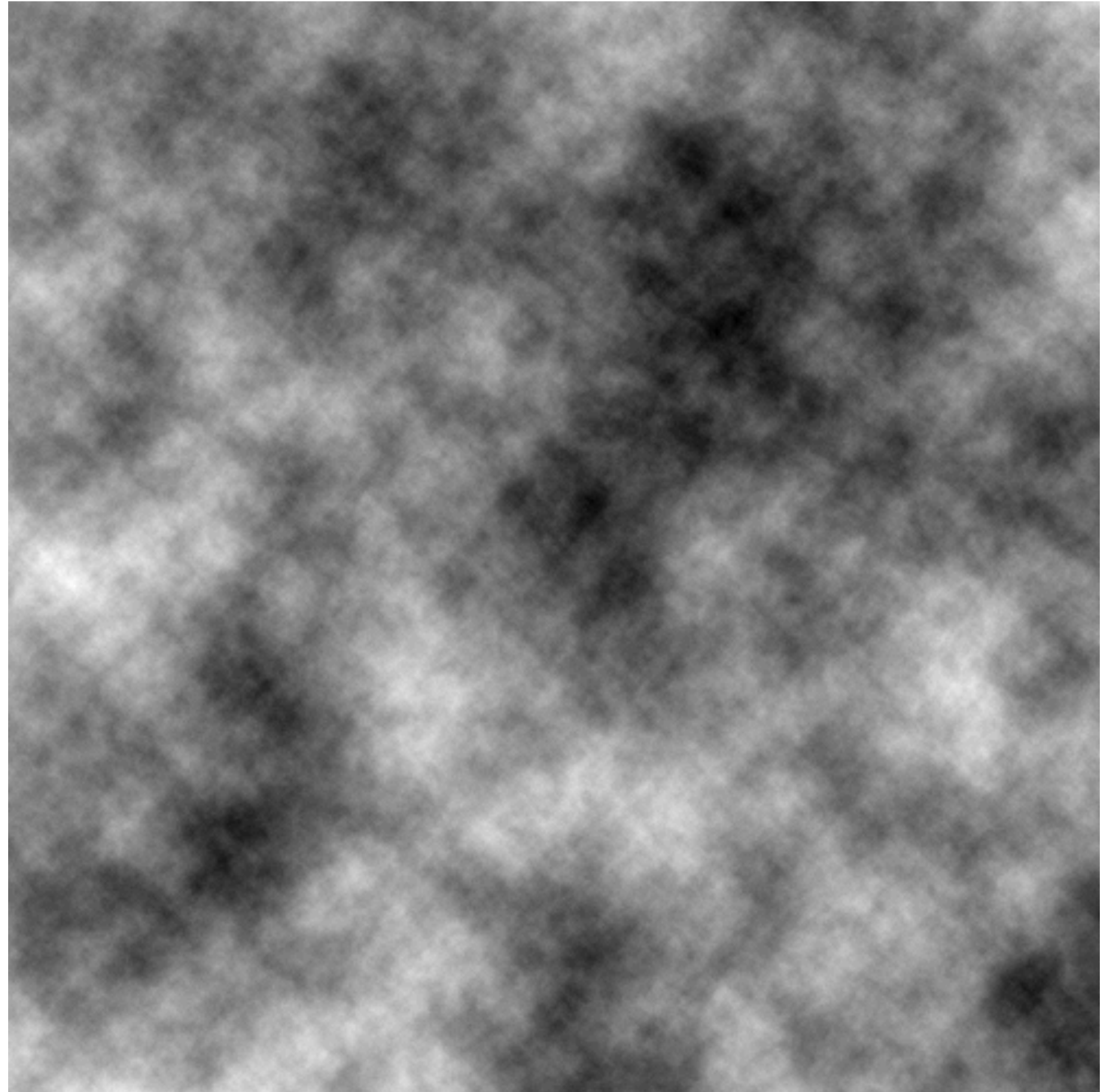
fBm Noise

Fractional Brownian Motion is the summation of successive octaves of noise, each with higher frequency and lower amplitude.



fBm Noise

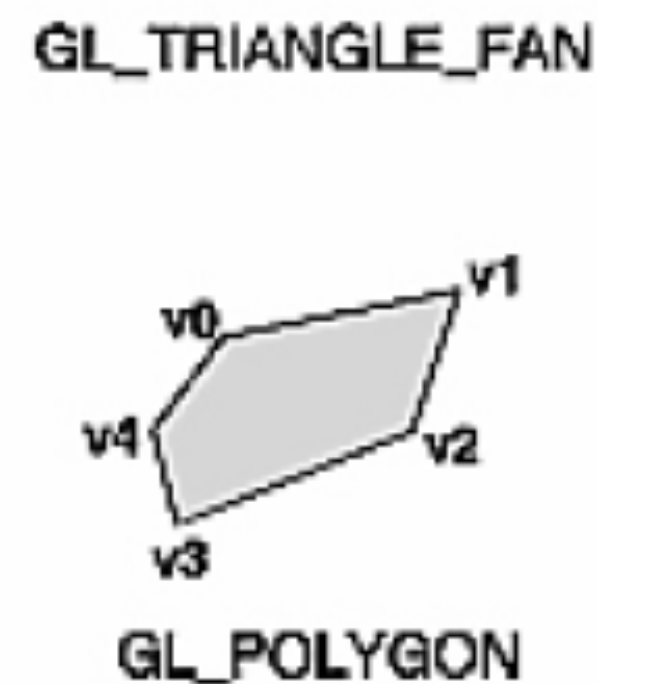
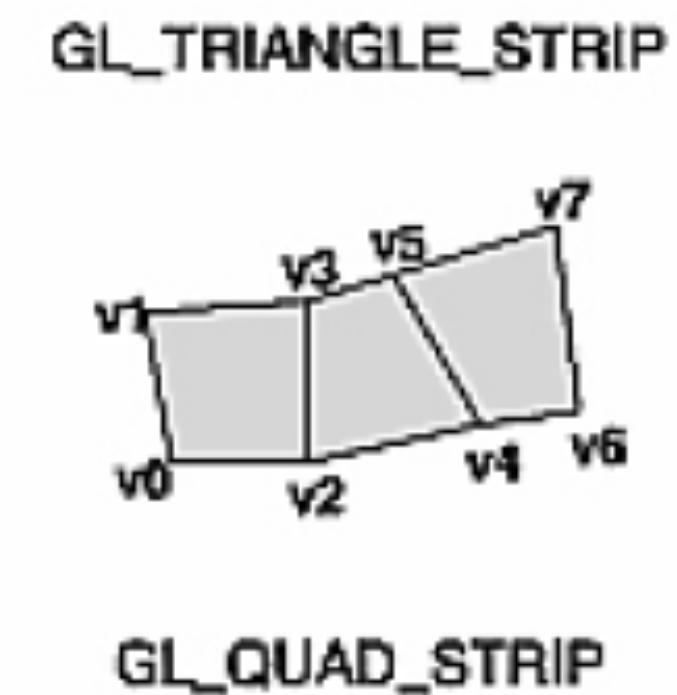
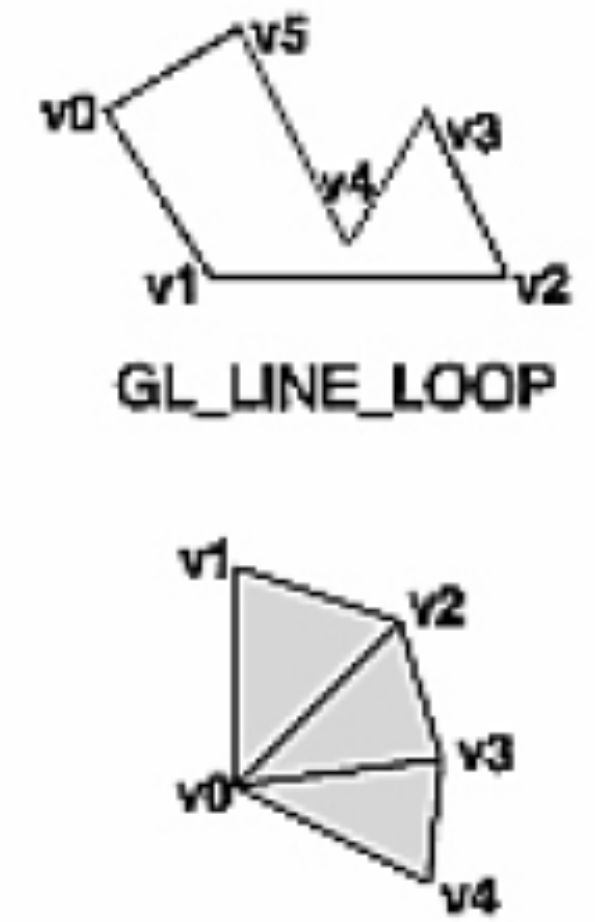
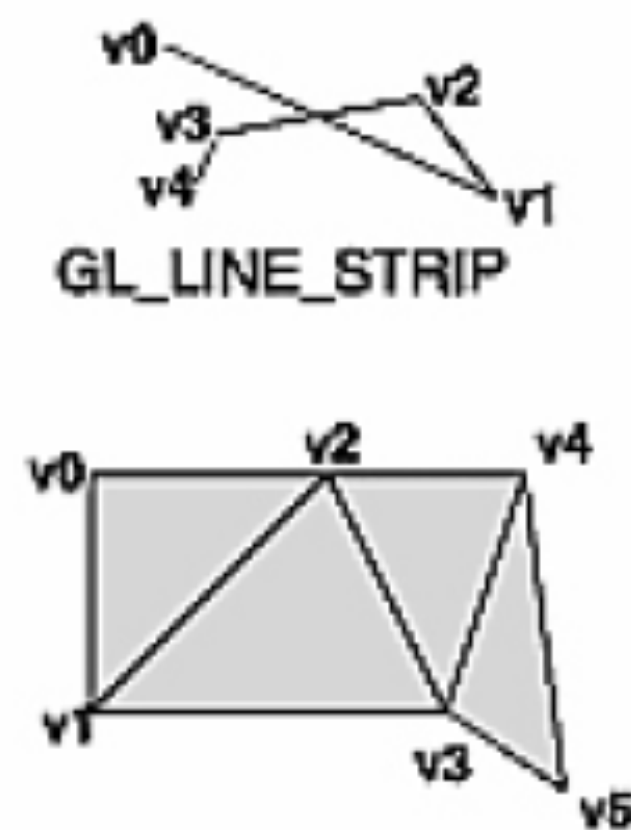
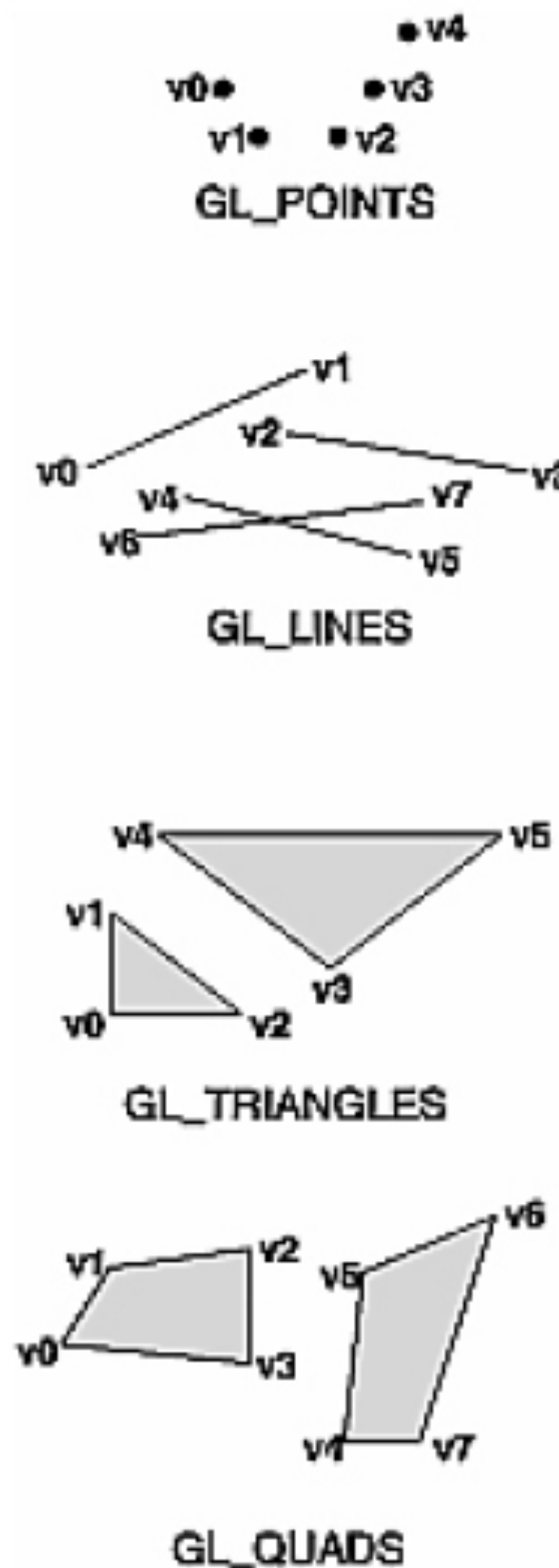
Fractional Brownian Motion is the summation of successive octaves of noise, each with higher frequency and lower amplitude.

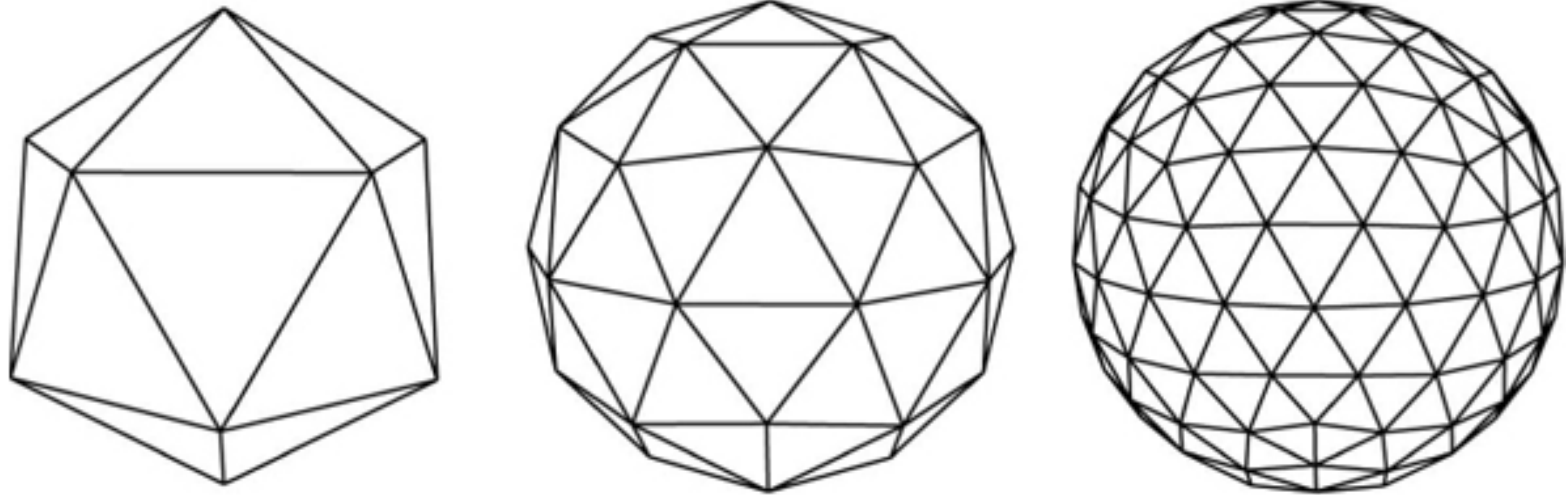


vec3 dfBm (float x, float y, float z)

x and y to get 2d noise. z could be used as time layer.

OpenGL Drawing Modes





Better visual, poorer performance.

Navigating in console

List all files in directory:

ls

Go in to directory:

cd [directory]

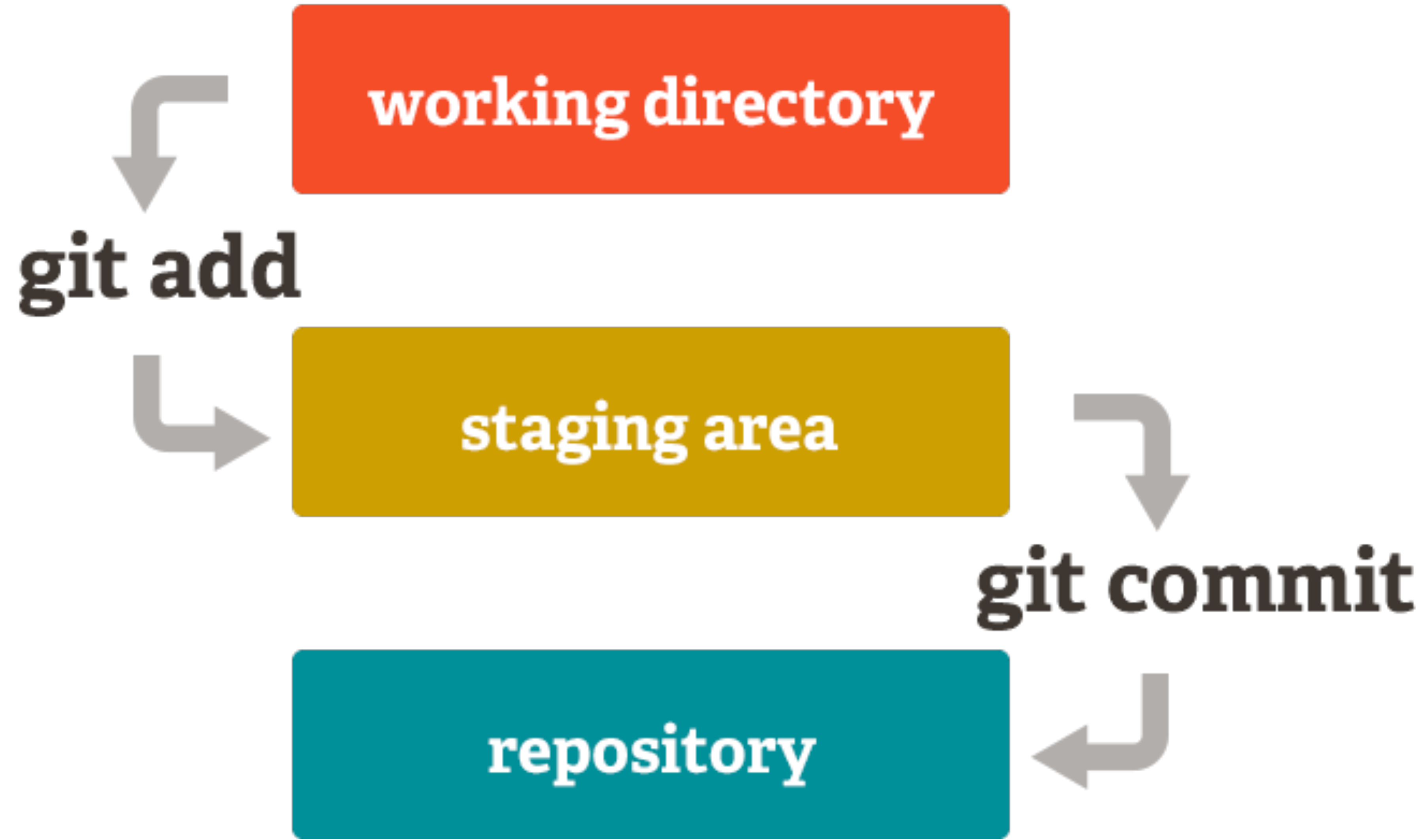
Go up:

cd ..

Open this folder:

open .

Git is not GitHub



Basic git commands

Initialize this directory:

```
git init
```

add file to HEAD:

```
git add [file]
```

commit current changes:

```
git commit -m "your message"
```

check your history:

```
git log
```

go to a particular history branch:

```
git checkout [commit id]
```

remove one file from HEAD

```
git checkout -- [file]
```

git reset HEAD -- hard

This will revert all your changes.

go here for a cheat-sheet, it is easy

<http://rogerdudler.github.io/git-guide/>

git push origin master

Push the master branch on your computer to the master branch on GitHub.

git pull

If you make changes other than your computer, then do this.

Homework

1. A particle system that involves more complicated behavior. Try use 3 or more physics influence (Think about fireworks, or water drops.) You can use several particle system to achieve this.
2. Create a repo on Github, name it `FirstName_Cinder_Currents`, put all your homework from previous weeks in there. Name them `week_1`, `week_2` etc.
3. (optional) have a particle system that has more than 10,000 particles running at full speed.