Organic Building Generation in
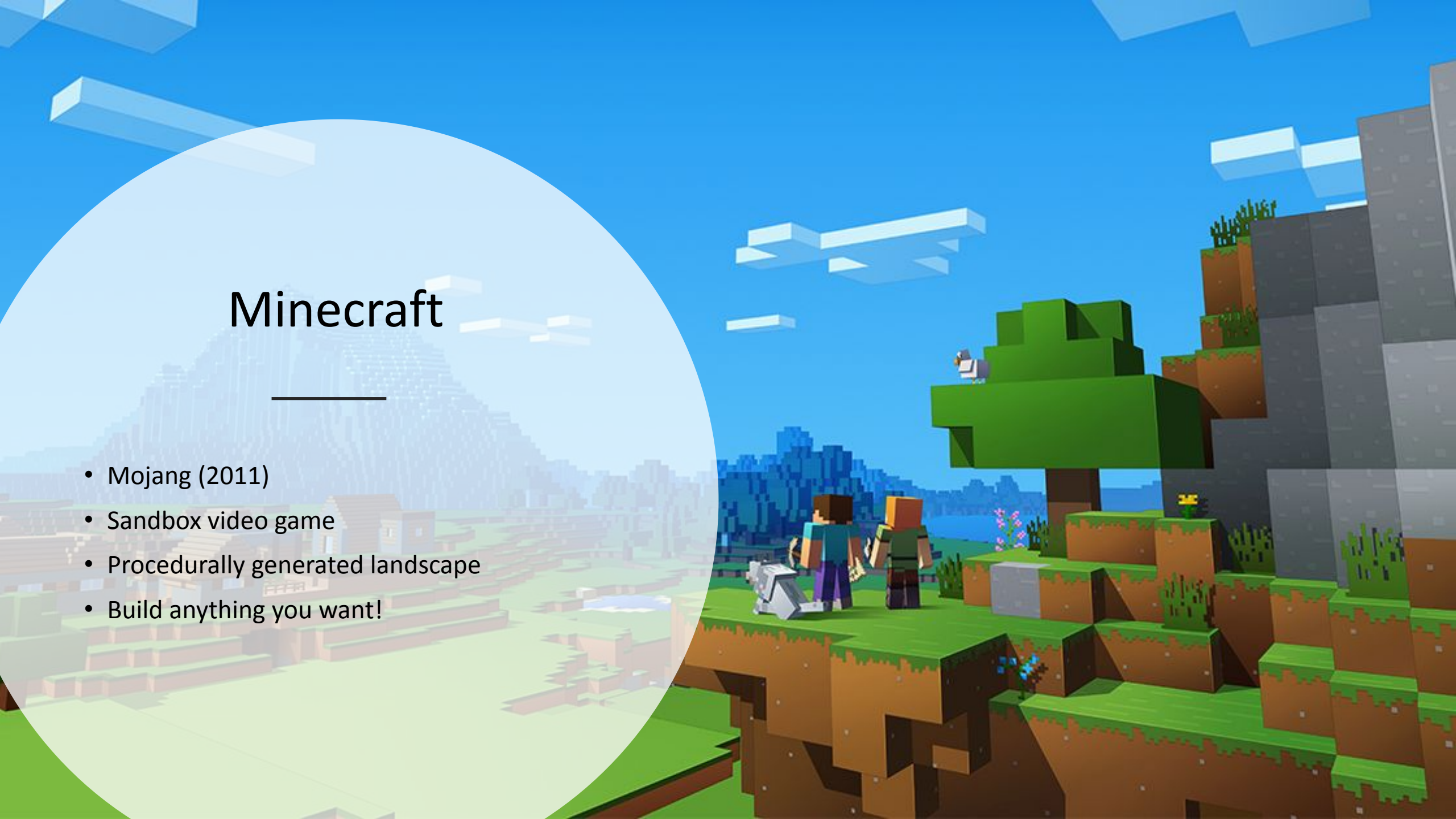
Minecraft

- Mojang (2011)
- Sandbox video game
- Procedurally generated landscape
- Build anything you want!

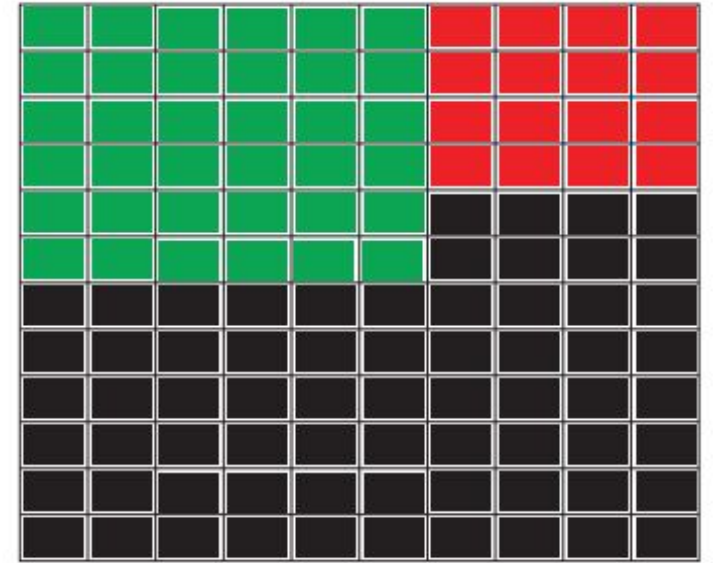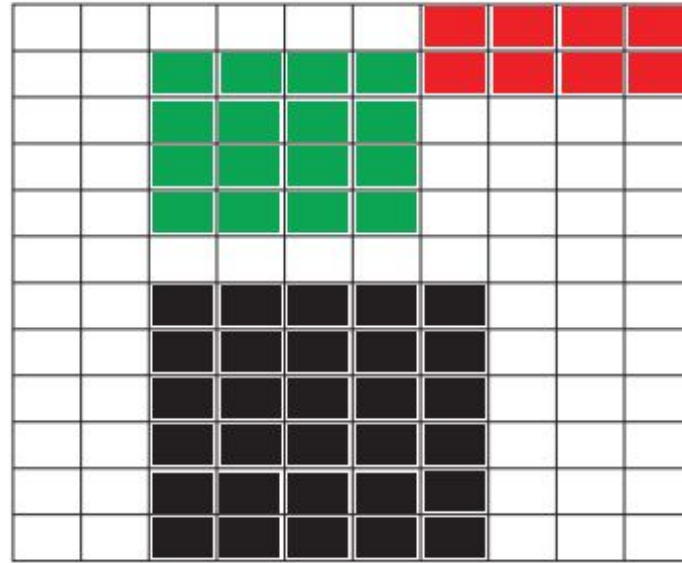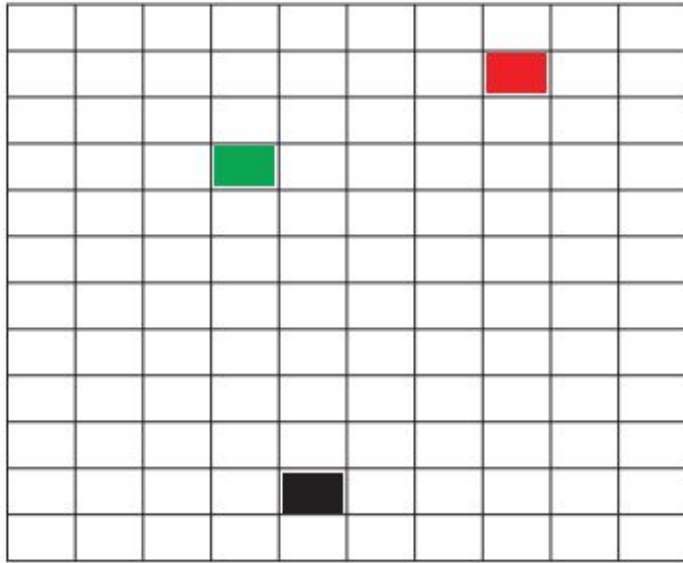# Generative Design in Minecraft (GDMC)

- Given: 3 maps with various terrain and biome

- Challenge: build a generator which can create a city

- Judging Criteria:
  - Adaptability
  - Functionality
  - Narrative
  - Aesthetics

- Lots of buildings
- No building interiors
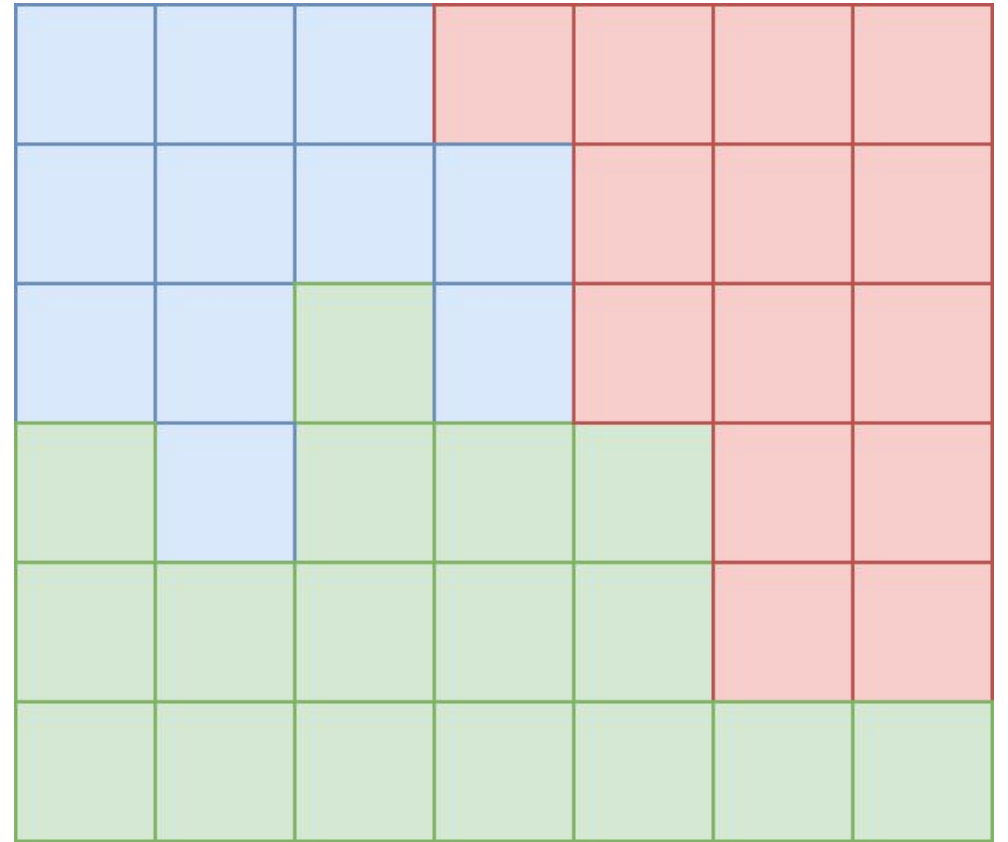- How can you quickly create a wide variety of building interiors?
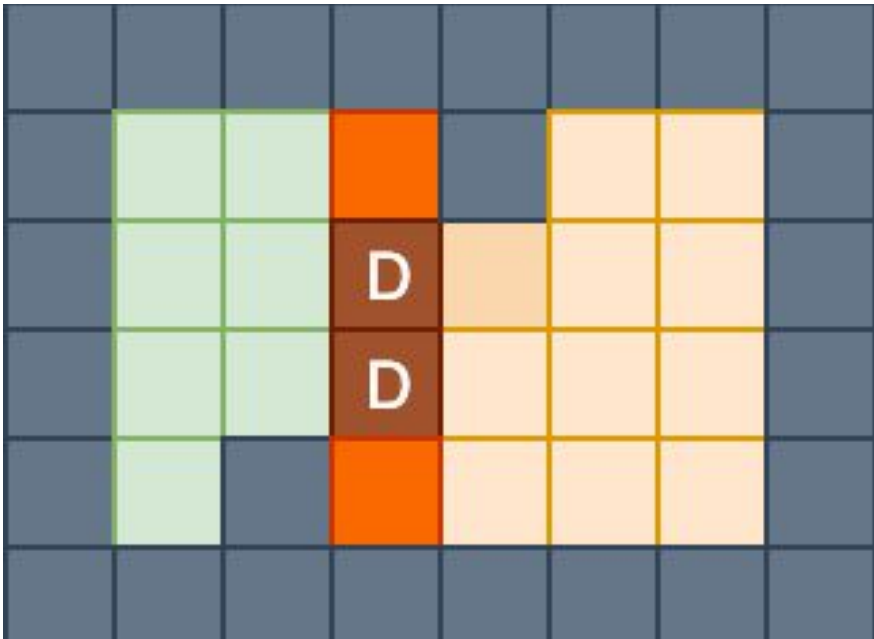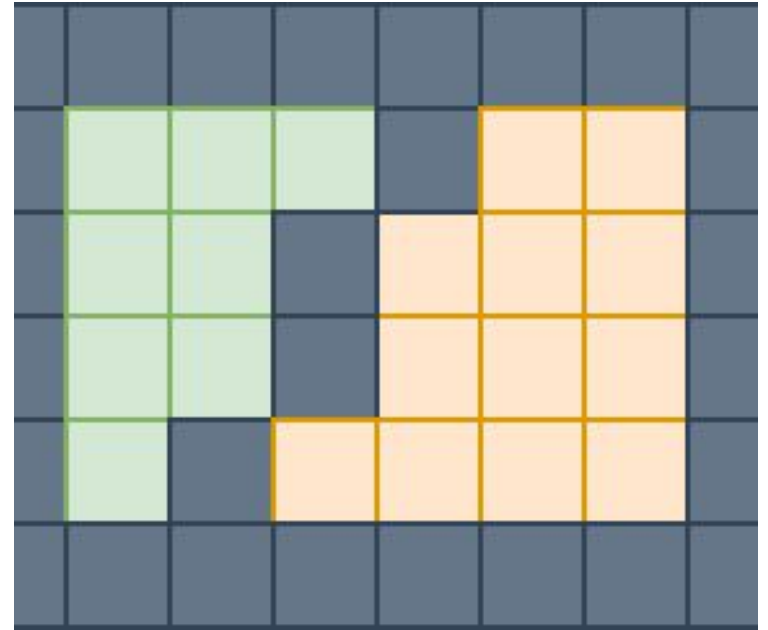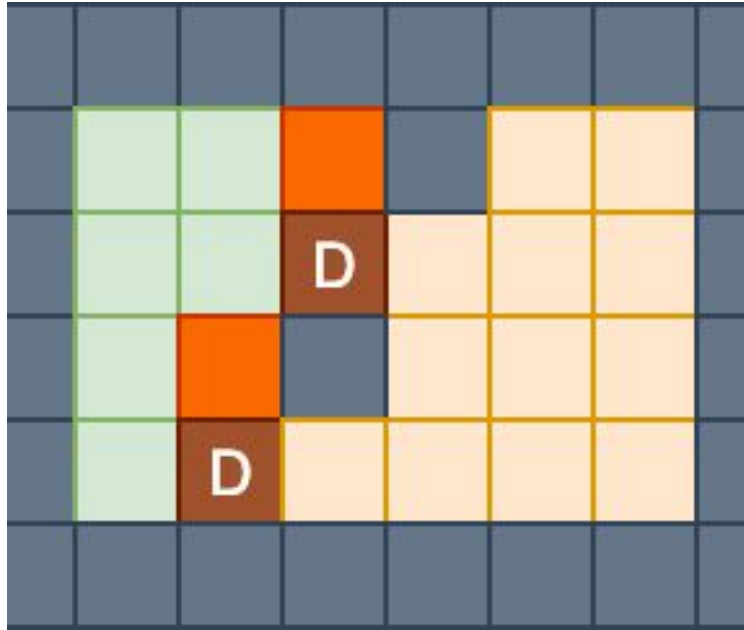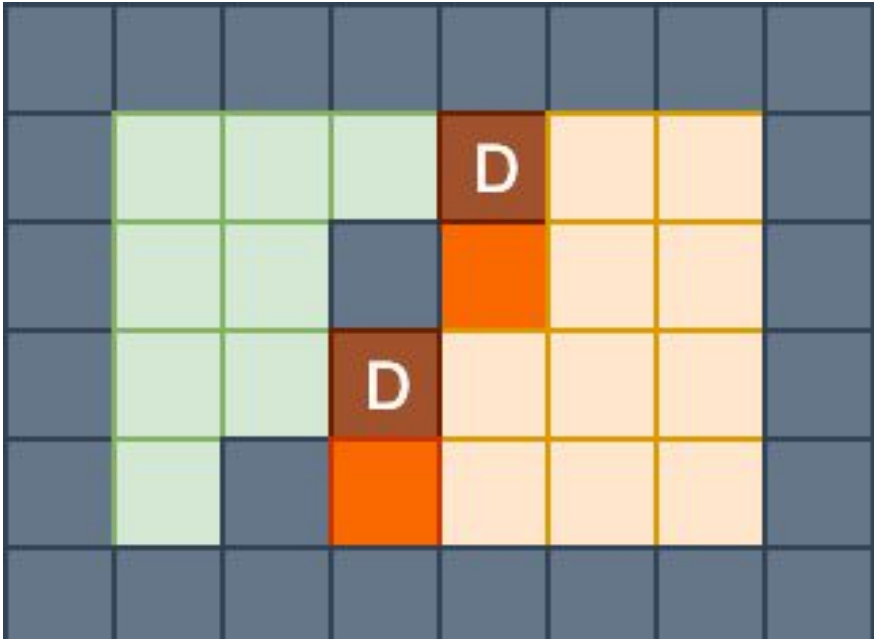
Motivations

Method

- Rectangular Constrained growth
- "A CONSTRAINED GROWTH METHOD FOR PROCEDURAL FLOOR PLAN GENERATION" – Lopez et al (2001)
  - Allows L-growth
- What if we want less rectangular rooms?

Organic Constrained Growth
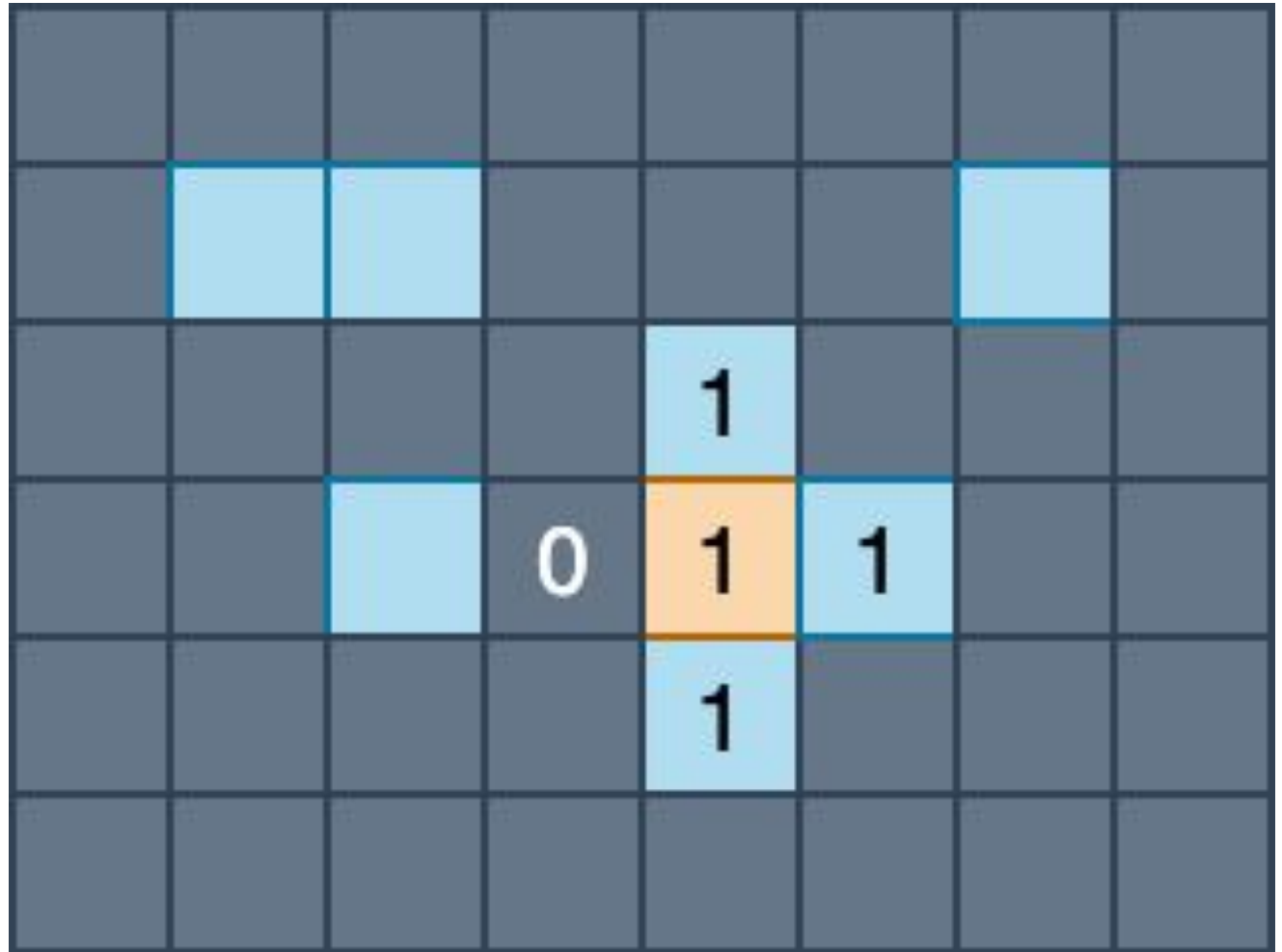
Ensuring Connectivity

External Wall Generation

- Cellular Automata
- Random Init: 75% wall, 25% window
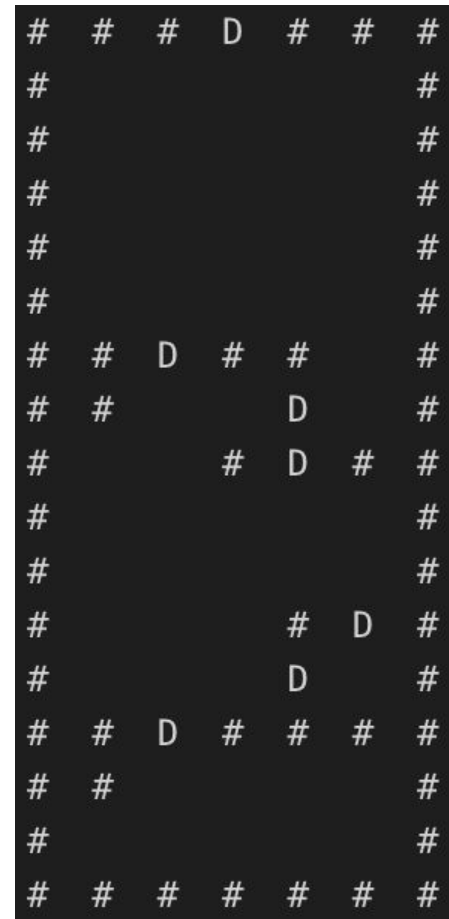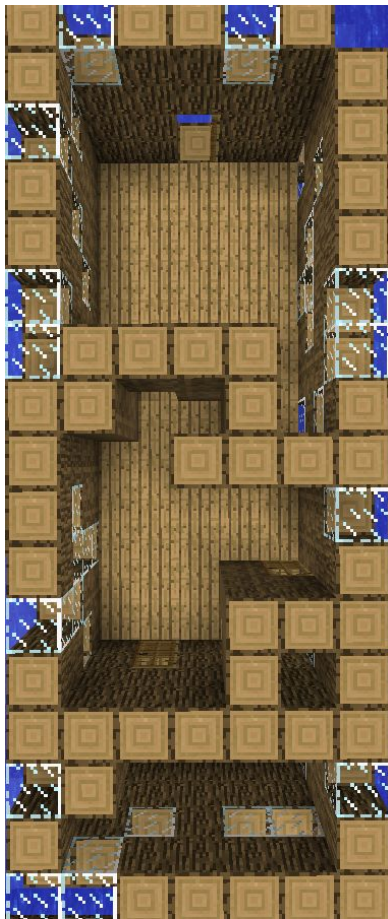- 10 Generations
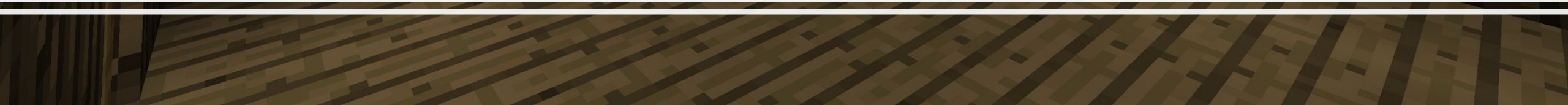
Rules:

0-1 or 4-5: Wall

2-3: Window

Experiments

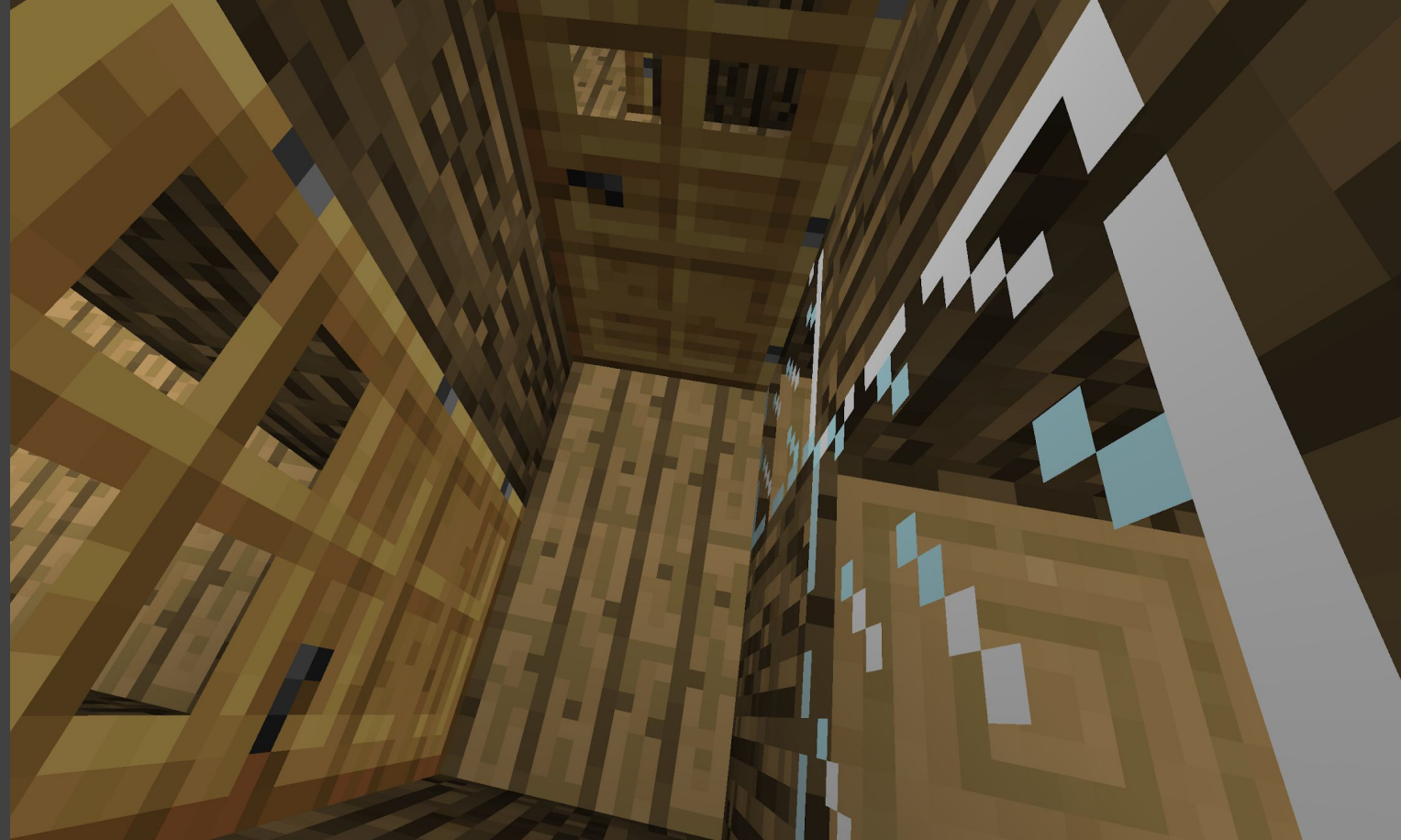| Room Dimension	Average Room Size	Average Door Count	Room Count	Time Taken (sec)
7x7	5.72 +- 0.069	3.92 +- 0.072	3	7.90
6x12	9.56 +- 0.069	5.40 +- 0.081	3	12.30
15x15	23.78 +- 0.061	18.21 +- 0.18	5	154.03

Generated Structure Examples

Cool Wall Mosaics

Unintended Closet Generation?