
Procedural Content Generation using JavaScript

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JSConf Colombia 2019



1. What is Procedural Generation?
2. What is it good for?
3. How to create a generator?
4. Some advantages of using JavaScript

What is Procedural Generation?

Instead of creating something, define a list of steps to be taken (a **procedure**) to create a given kind of that something.

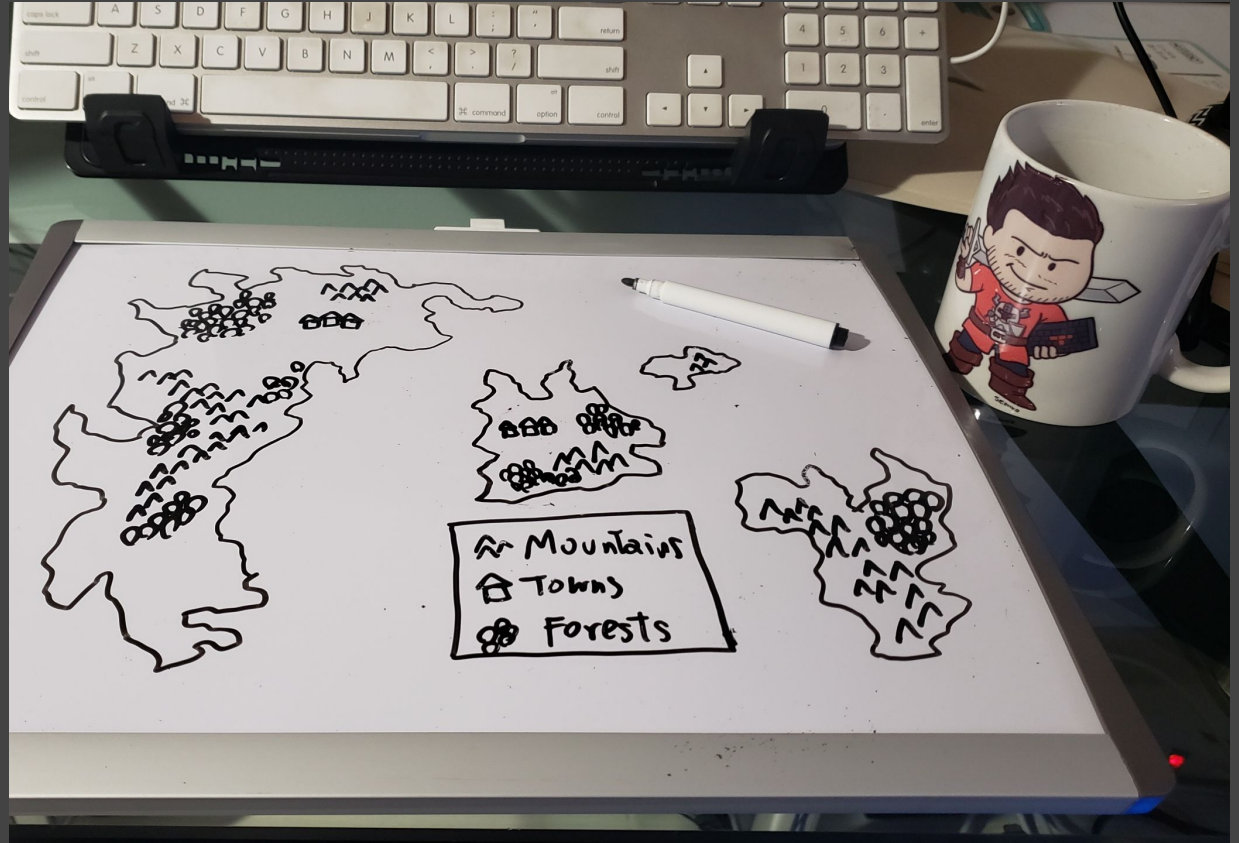
Example: Geography Generation



"The World of Tutoriala" por Jan Loos
<http://www.online-tabletop.com/art/fantasy-map/>

Option 1

Draw the map



Option 2

Design a procedure

1. Toss coins of 100, 200 and 1000 pesos.
 2. Draw an outline around the nearest coins.
 3. Place terrain features around each coin based on their face value.
-

Step 1

Toss coins of 100, 200
y 1000 pesos.



Step 2

Draw an outline around the nearest coins.

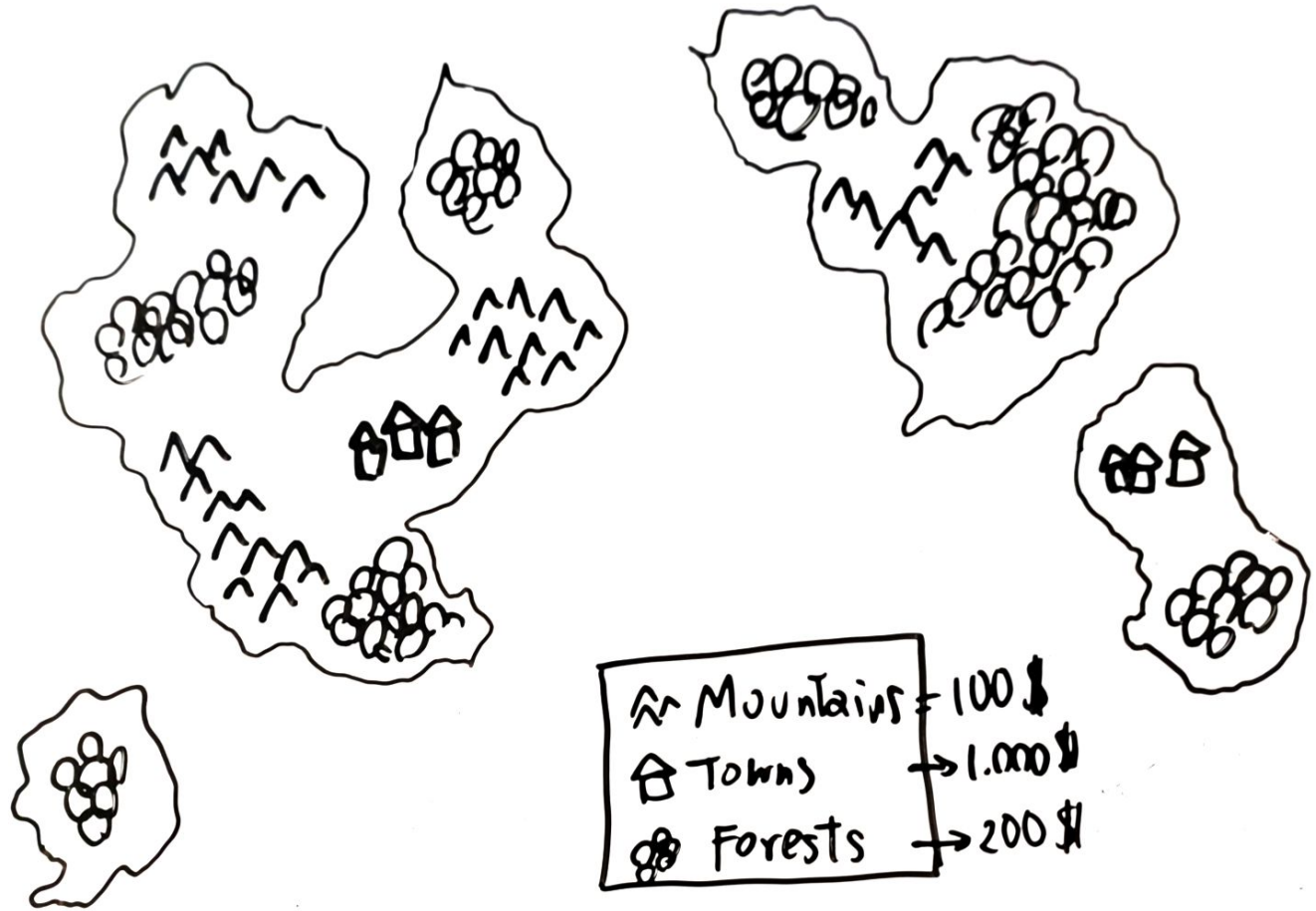


Step 3

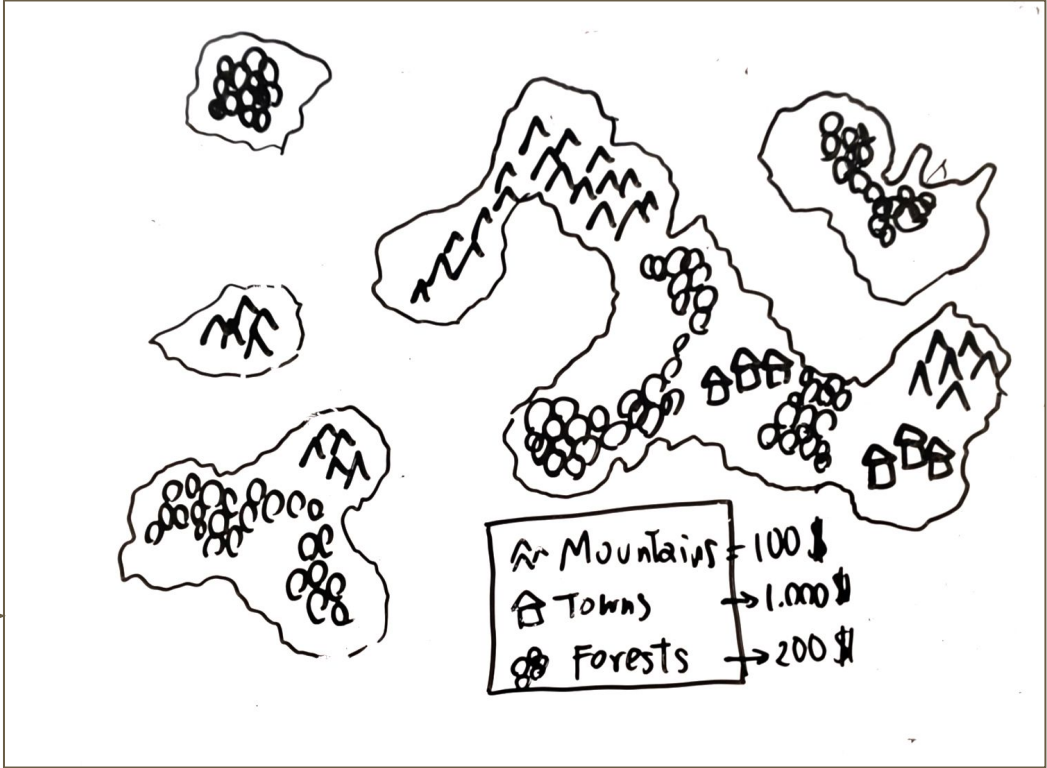
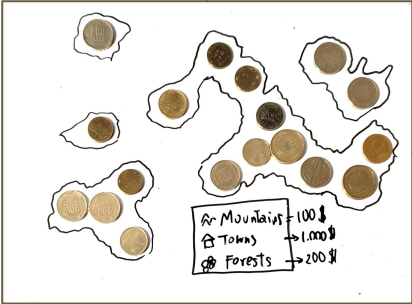
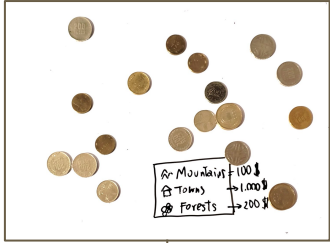
Place terrain features around each coin based on their face value.



A map

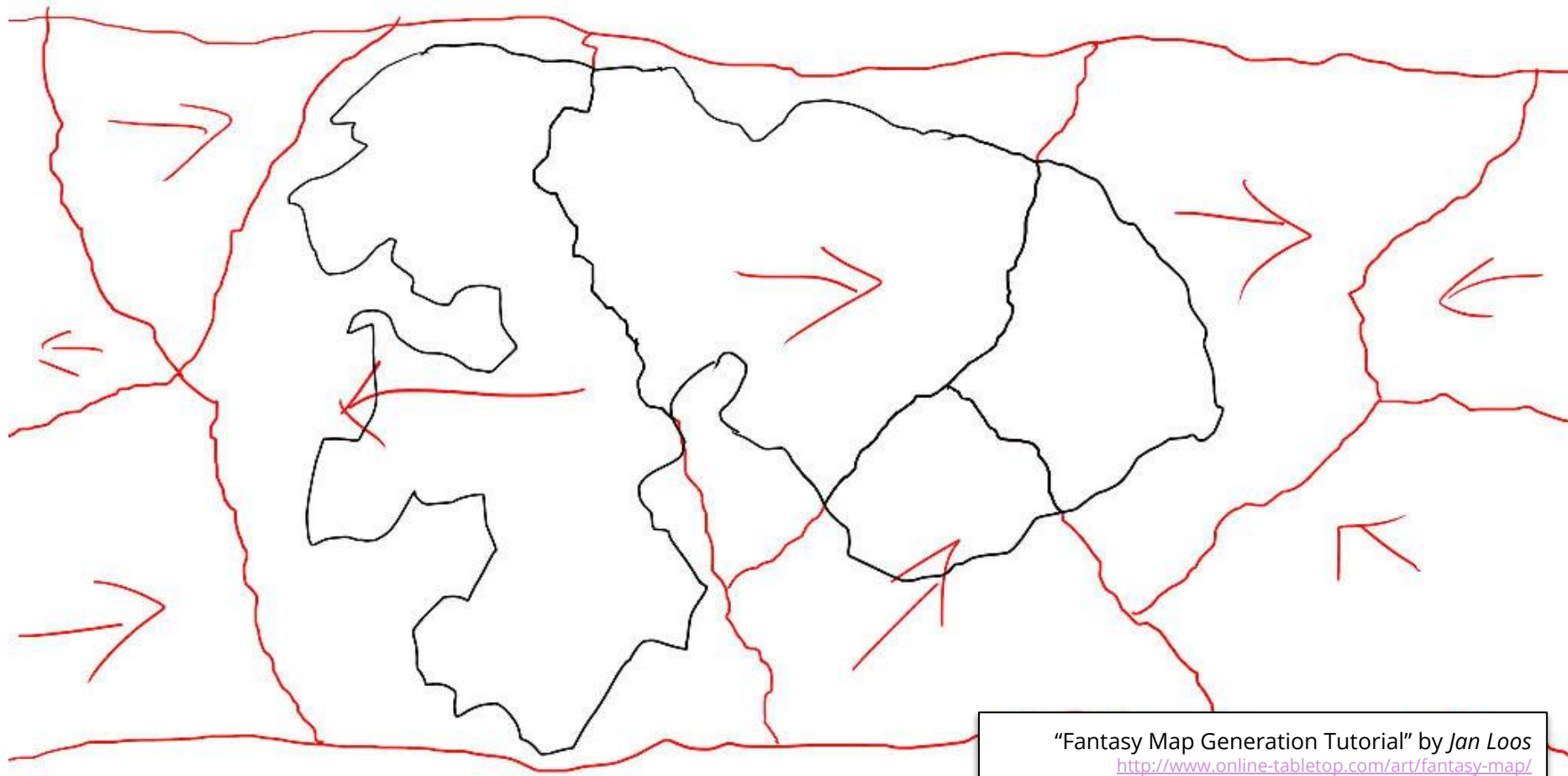


n maps



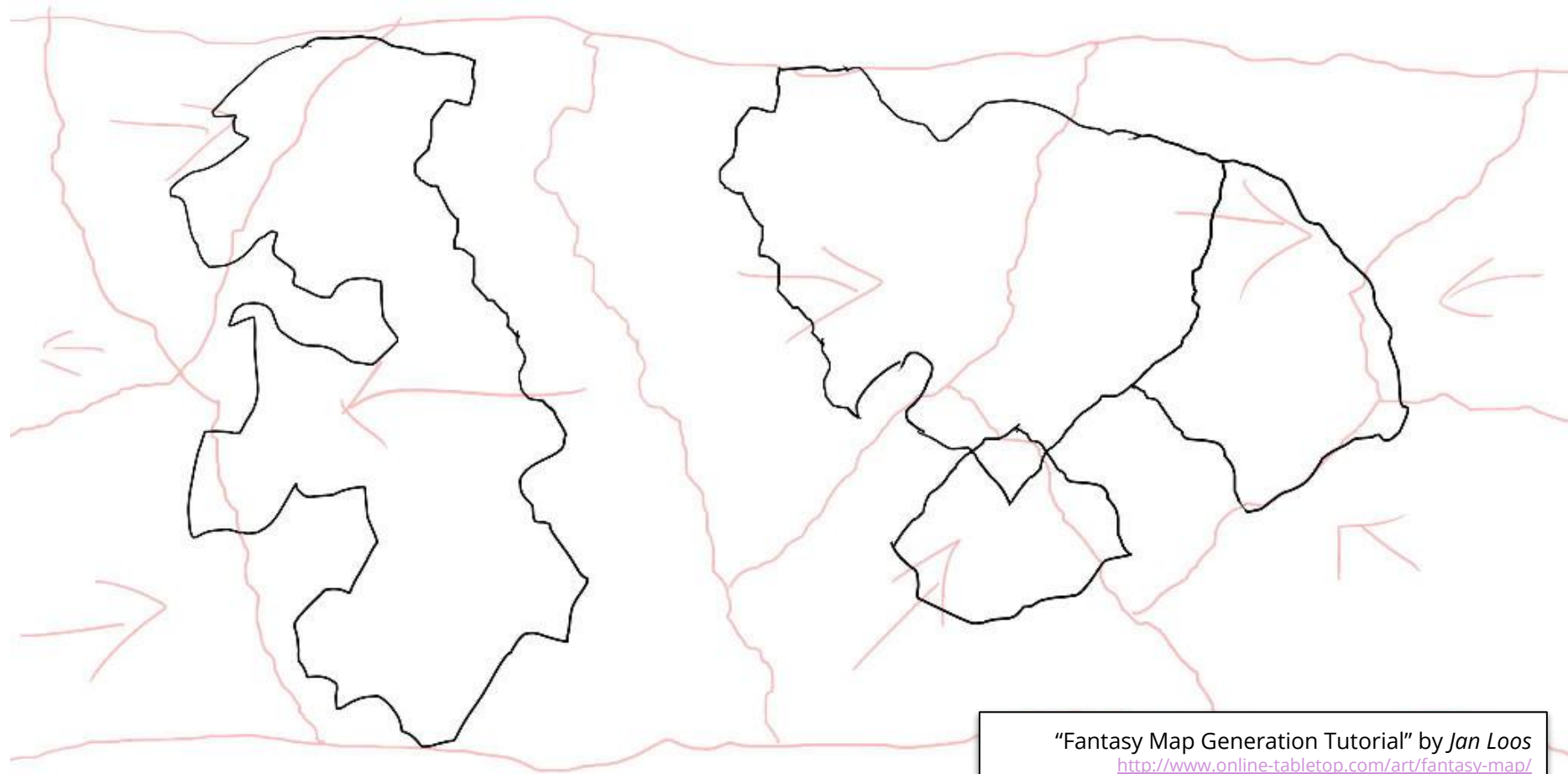
More complex procedures



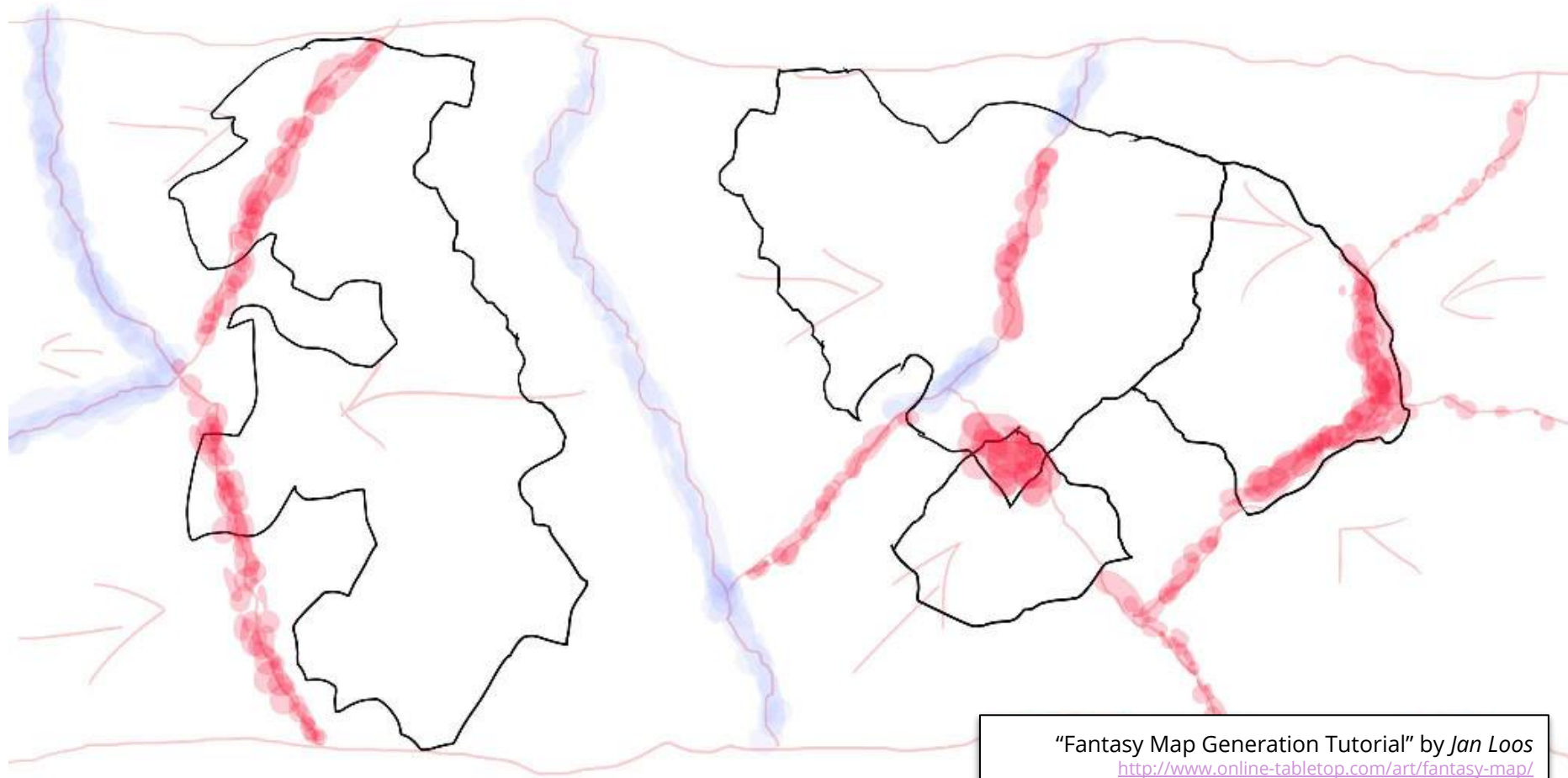


"Fantasy Map Generation Tutorial" by Jan Loos

<http://www.online-tabletop.com/art/fantasy-map/>

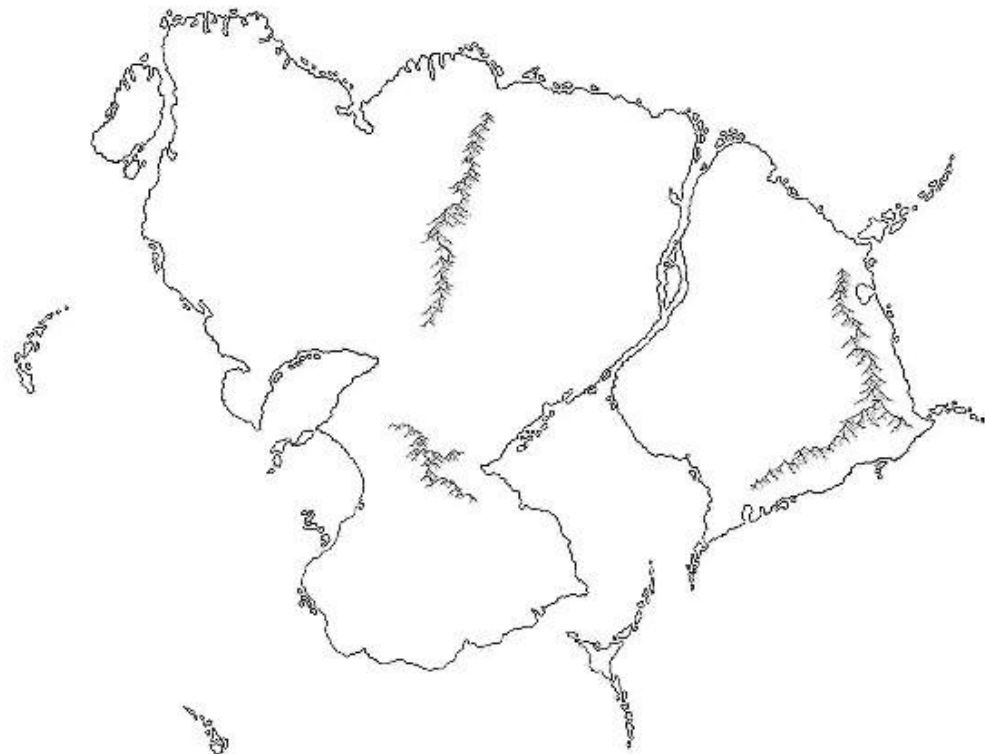
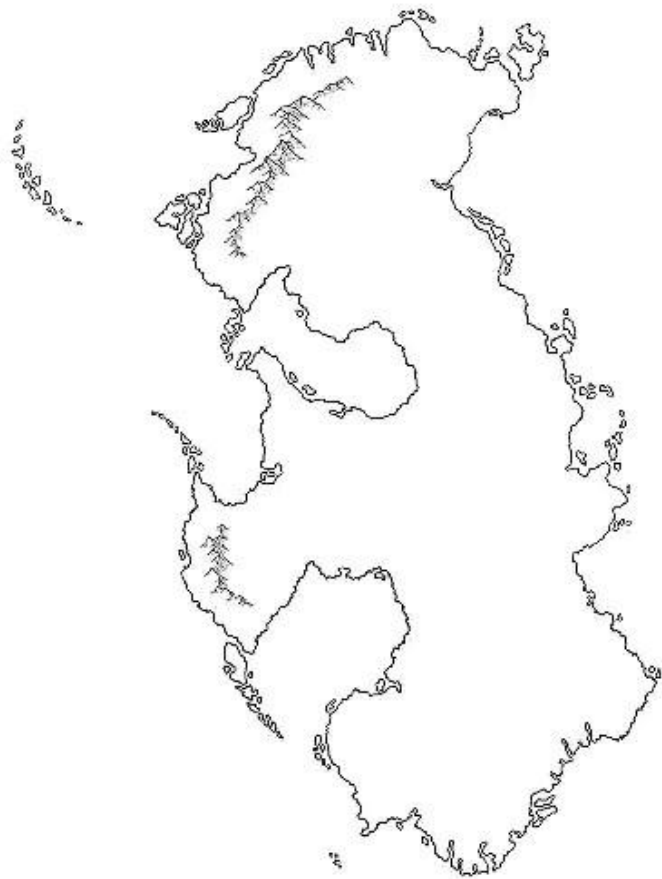


"Fantasy Map Generation Tutorial" by *Jan Loos*
<http://www.online-tabletop.com/art/fantasy-map/>



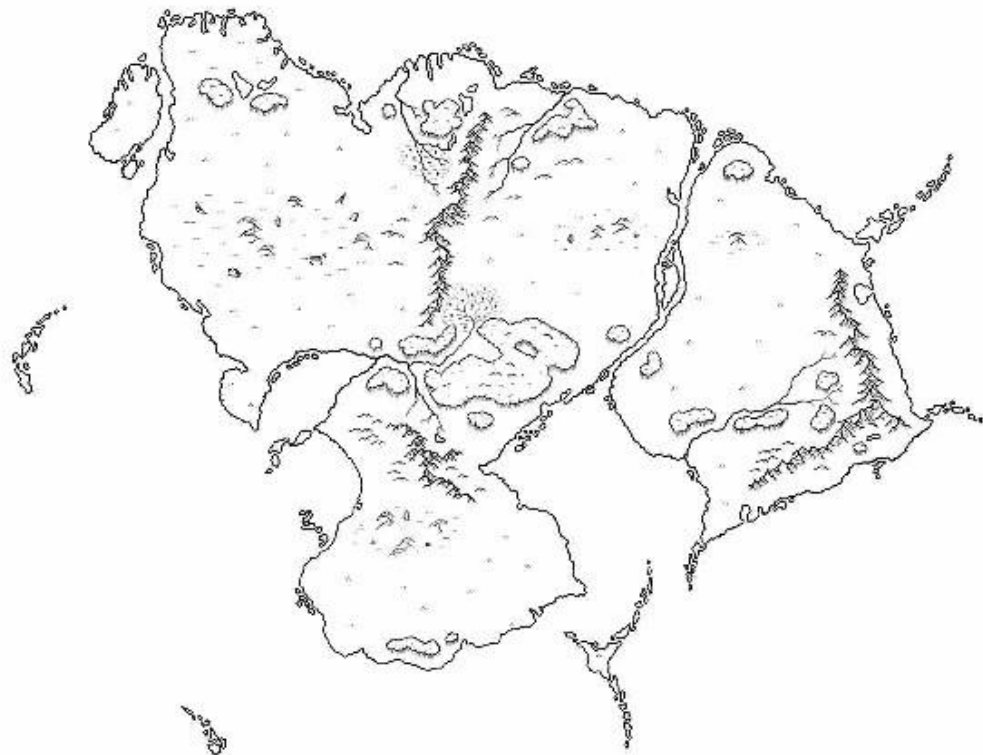
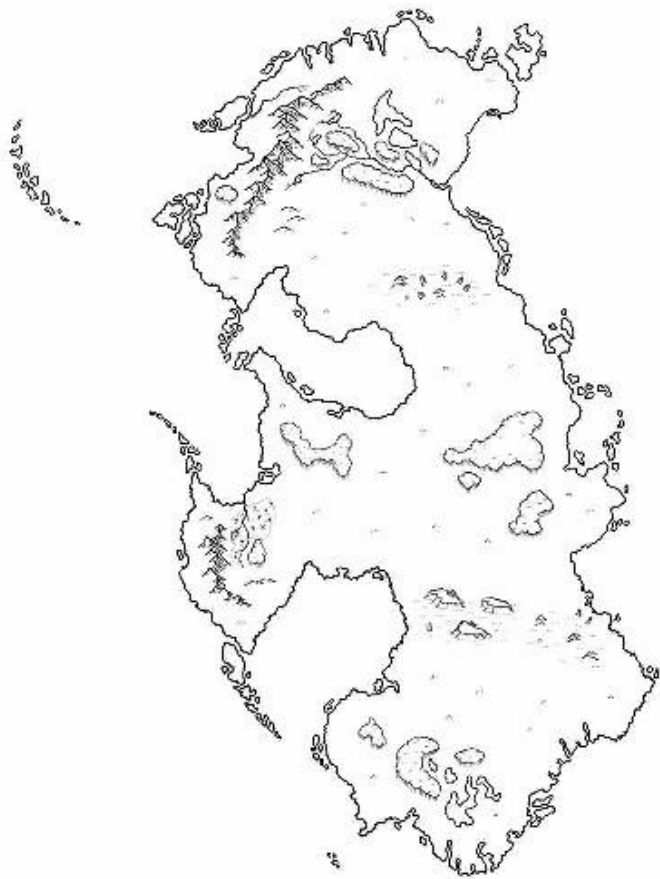
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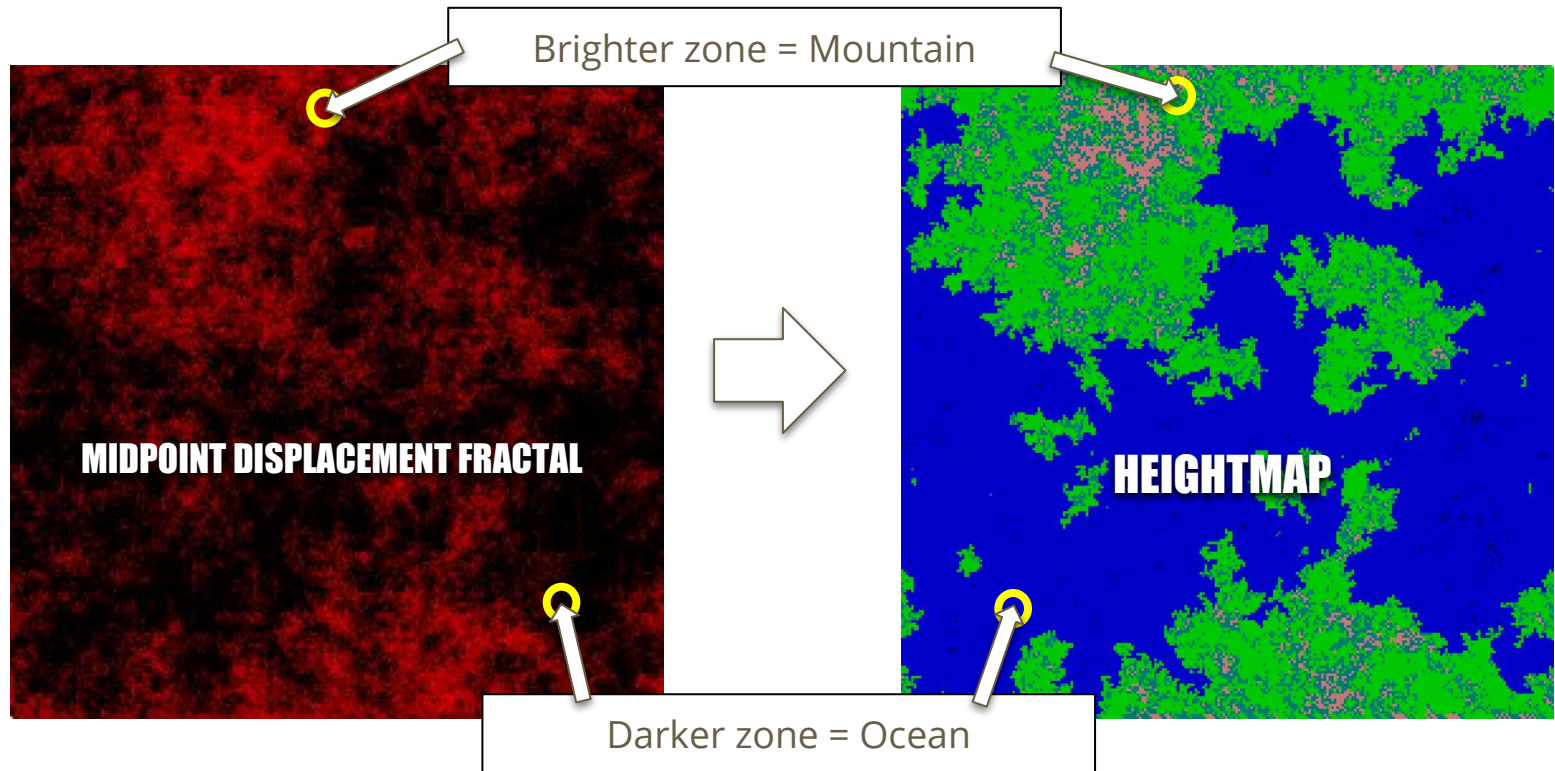


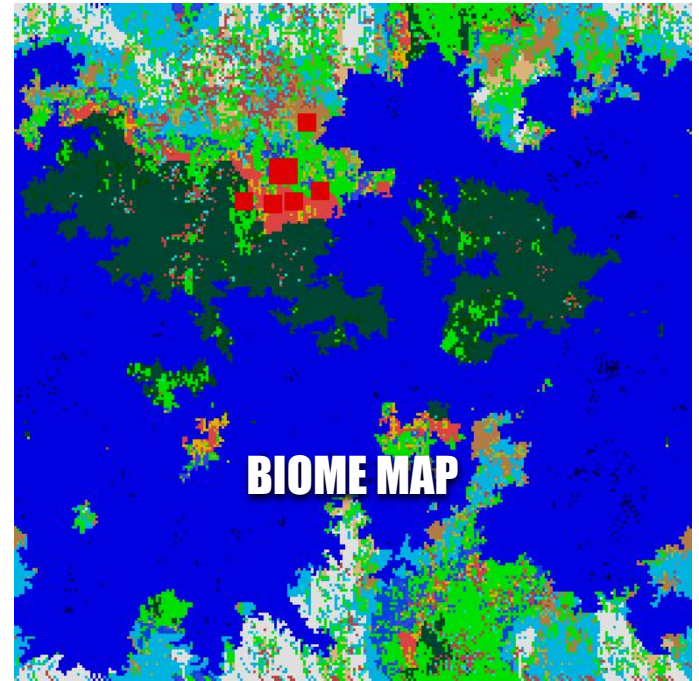
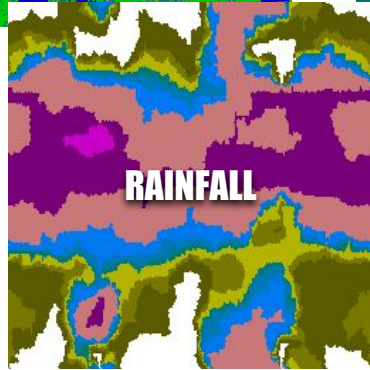
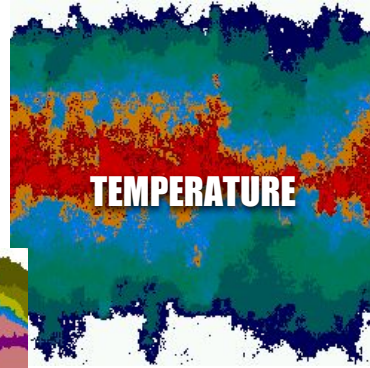
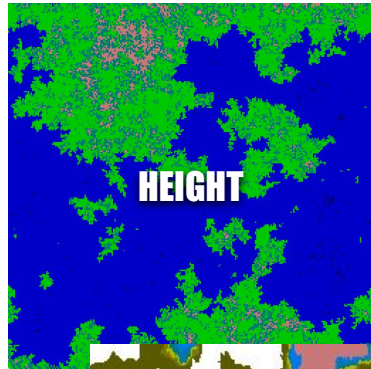
"Fantasy Map Generation Tutorial" by Jan Loos

<http://www.online-tabletop.com/art/fantasy-map/>

Procedural Generation using Software

1. Handle Complexity
 2. Automate
-





A collection of various coins, including US pennies, nickels, dimes, and quarters, as well as a 200 Pesos coin, scattered across a light gray background. The coins are of different colors and denominations, some showing the word 'LIBERTY' and others showing '200 PESOS' or 'UNITED STATES OF AMERICA'.

Automatization

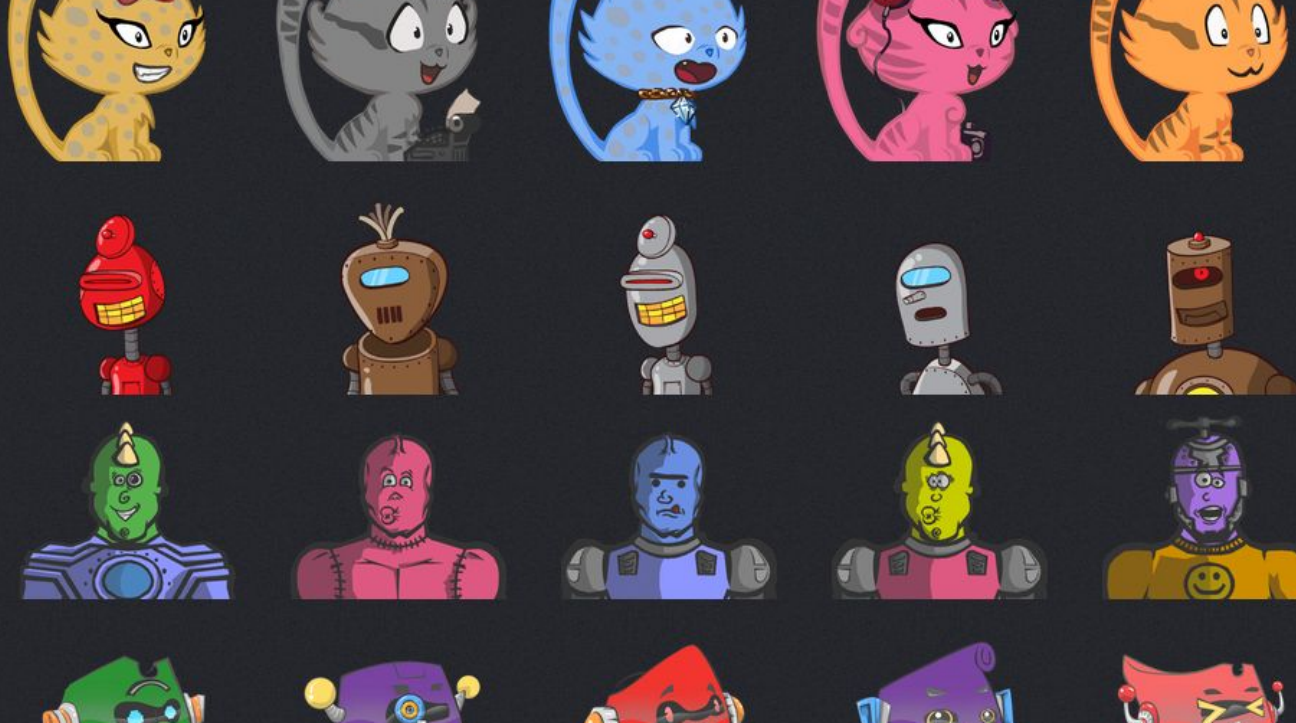
⌄ Mountains = 100 \$

⌄ Towns → 1.000 \$

⌄ Forests → 200 \$

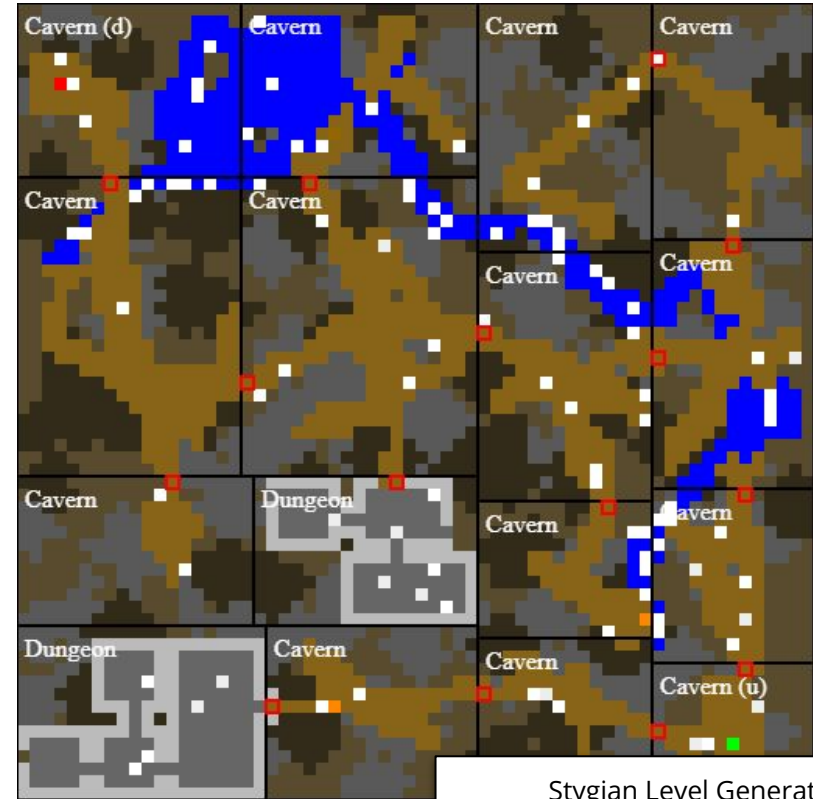
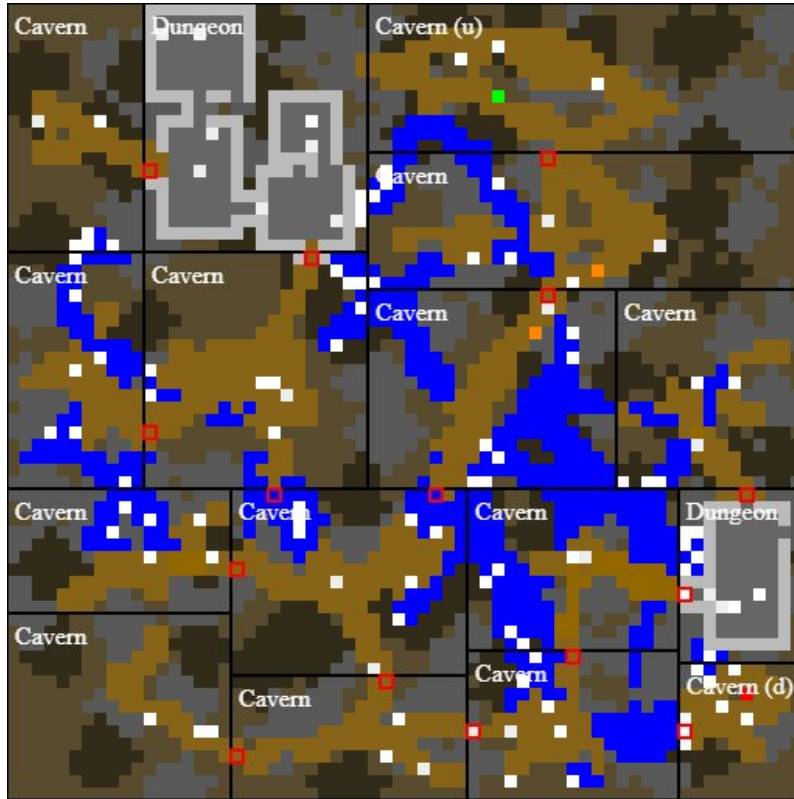


**What is it
good for?**



Provide personalized content

"Robohash" by Robohash.org
<https://robohash.org/>



Stygian Level Generator
<http://slashie.net/stygianGen/>

Extend the experience for the user

#9 - Retolna



#11 - Sacajer



#14 - Jucci



#18 - Ronxabna



#19 - Fufial



#26 - Jojbo



#27 - Xemi



#34 - Fikkob



#35 - Sugsin



#36 - Koxoge



#43 - Susjoftu



#62 - Pidun



#65 - Babxesbo



#77 - Magef



Optimize Storage

#85 - Cukgetgo



#111 - Custaro



#114 - Xetxo



#119 - Xesu



#137 - Mano



#141 - Gixo



Backpack Monsters

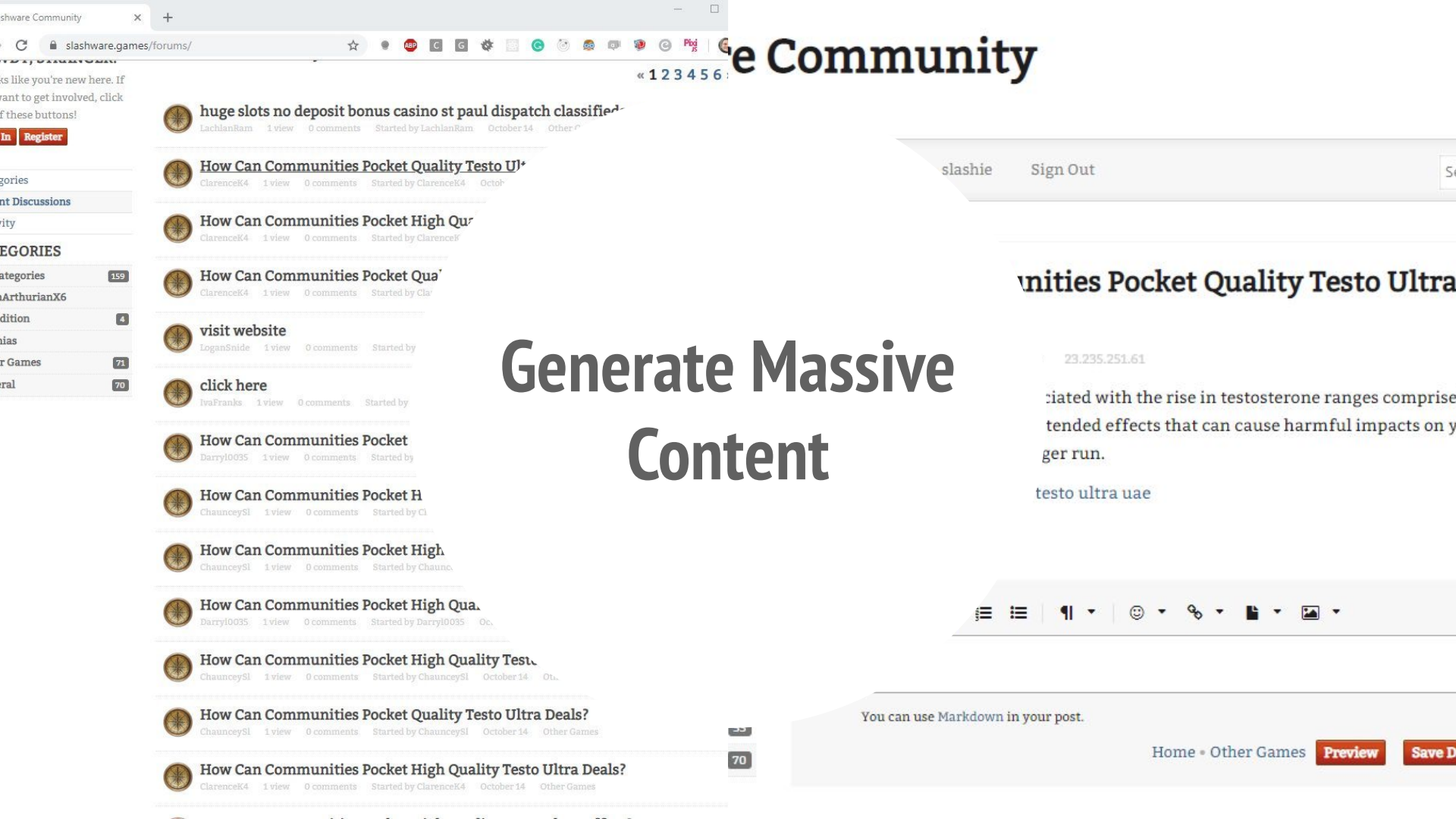
<http://slashie.net/bpm/>



Explore the limits of “creativity”

Procedural Art

“Blue 2, frame 5525” by *Circle and Square*
<https://square-the-circle.com/2013/04/13/>



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- ArthurianX6
- 4
- 71
- 70

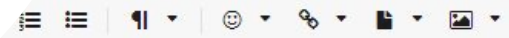
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testo ultra uae



You can use Markdown in your post.



How to make a procedural content generator?

How to make a procedural content generator?

1. Collect references
2. Analyze patterns
3. Design and Implement a “stack”
of generators

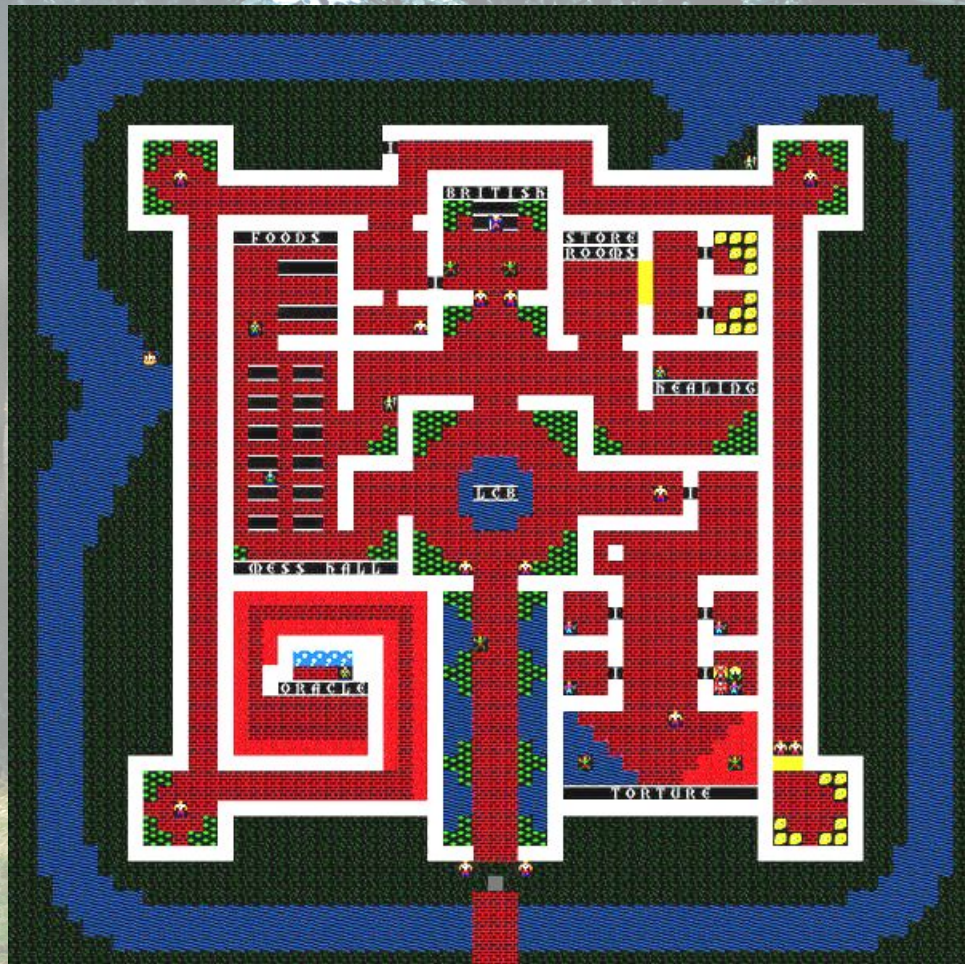
1. Collect references

A person with a large red backpack is walking across a suspension bridge that spans a deep valley filled with dense green forest. The bridge is made of metal cables and a mesh floor. In the background, there are more forested mountains under a hazy sky. The overall scene is a natural, outdoor setting.

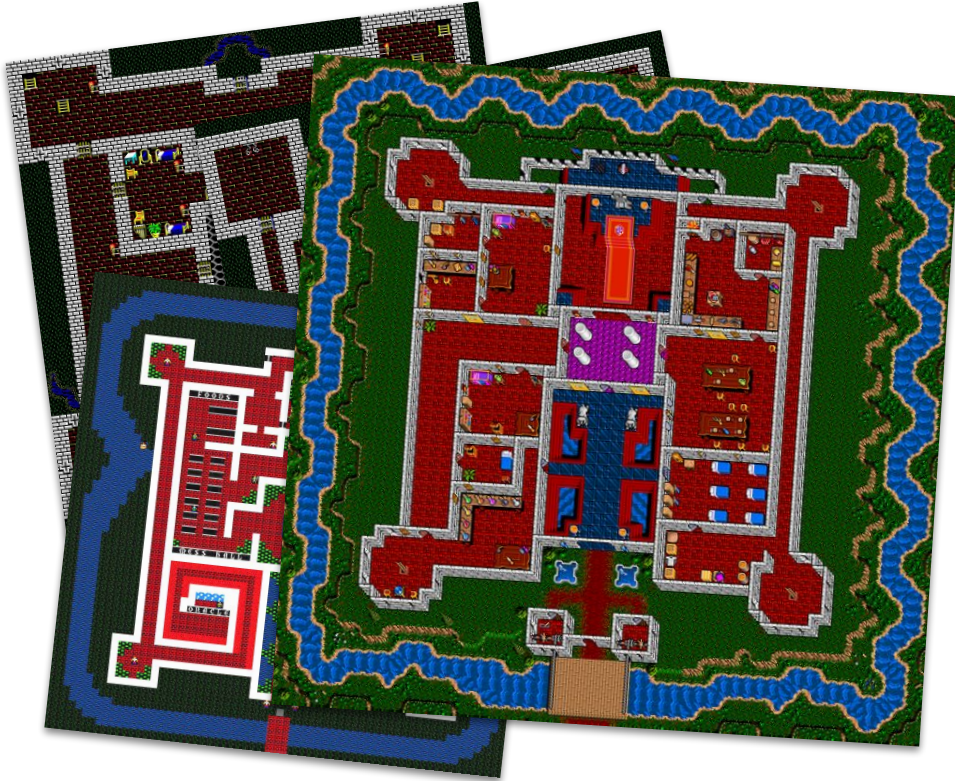






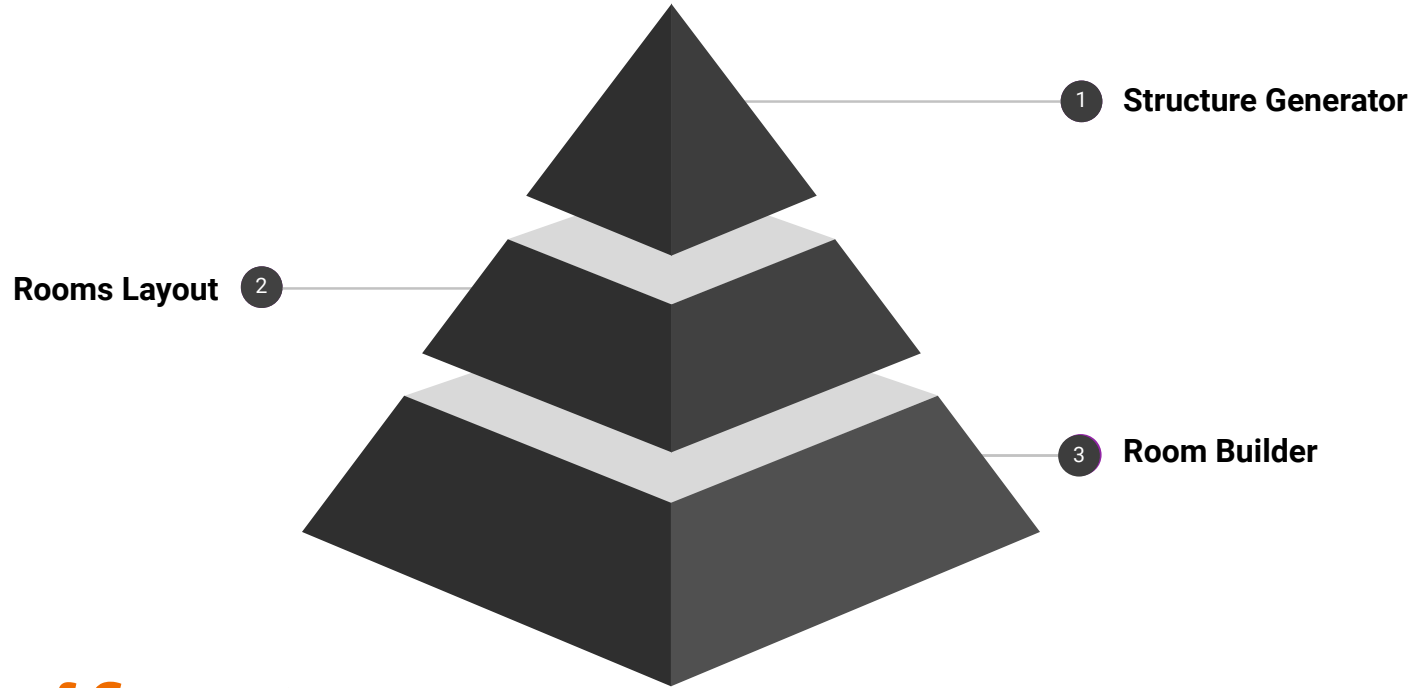


2. Analyze patterns



- All of them are square structures with towers in their corners.
- Some have a moat.
- Almost always, there is a big room in the middle, which can be a courtyard or a closed area
- As for the towers:
 - Some has a cross-shaped window.
 - They can be square or circular.
 - They might be connected to the other towers.

...

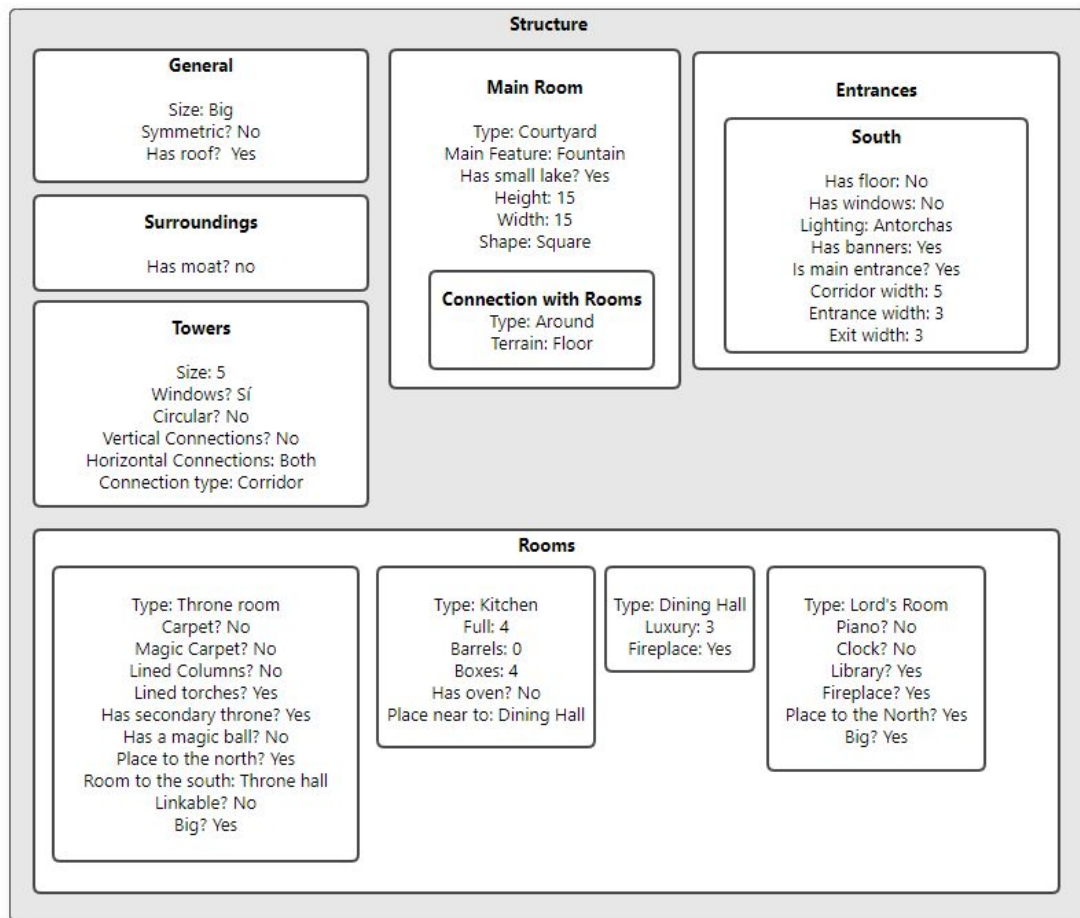


3. Stack of Generators

First Layer

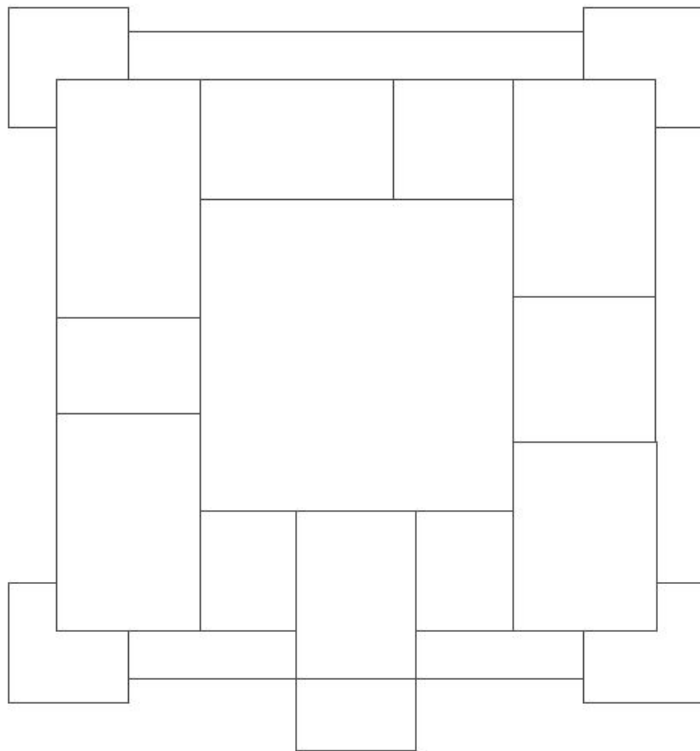
Structure Generator

(CastleStructureGenerator.js)



Second Layer

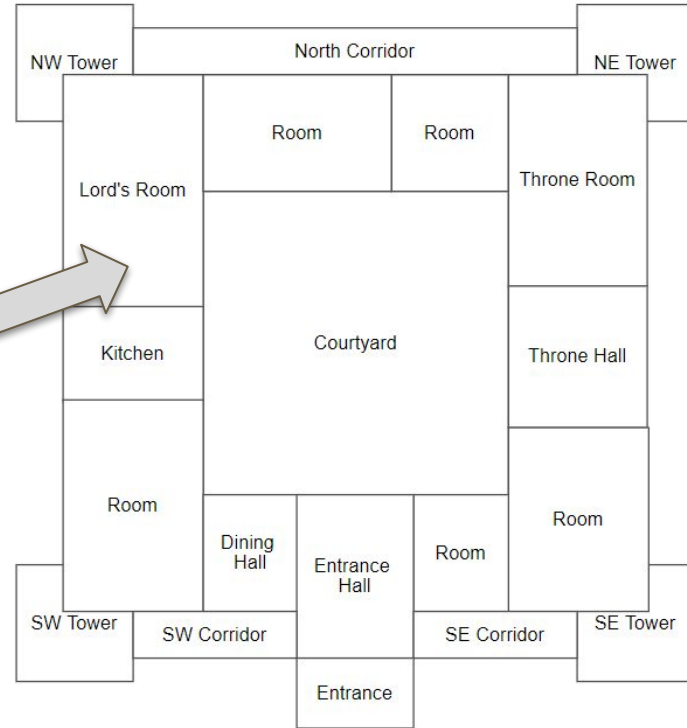
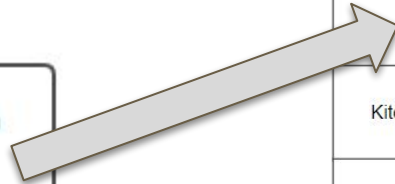
Room Layout (RoomsGenerator.js)



Second Layer

Room Layout (RoomsGenerator.js)

Type: Lord's Room
Piano? No
Clock? No
Library? Yes
Fireplace? Yes
Place to the North? Yes
Big? Yes

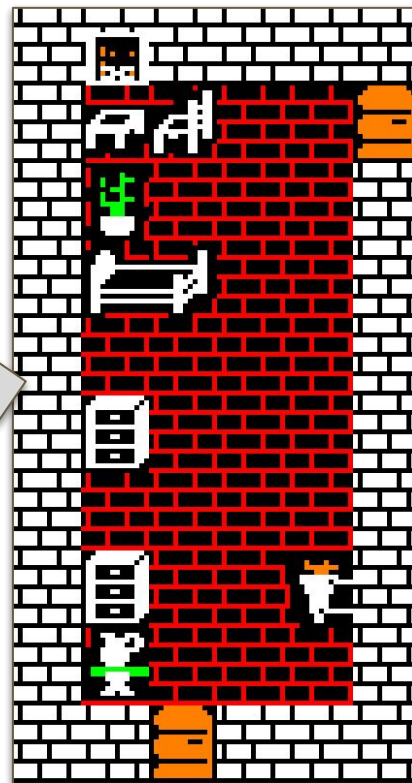


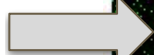
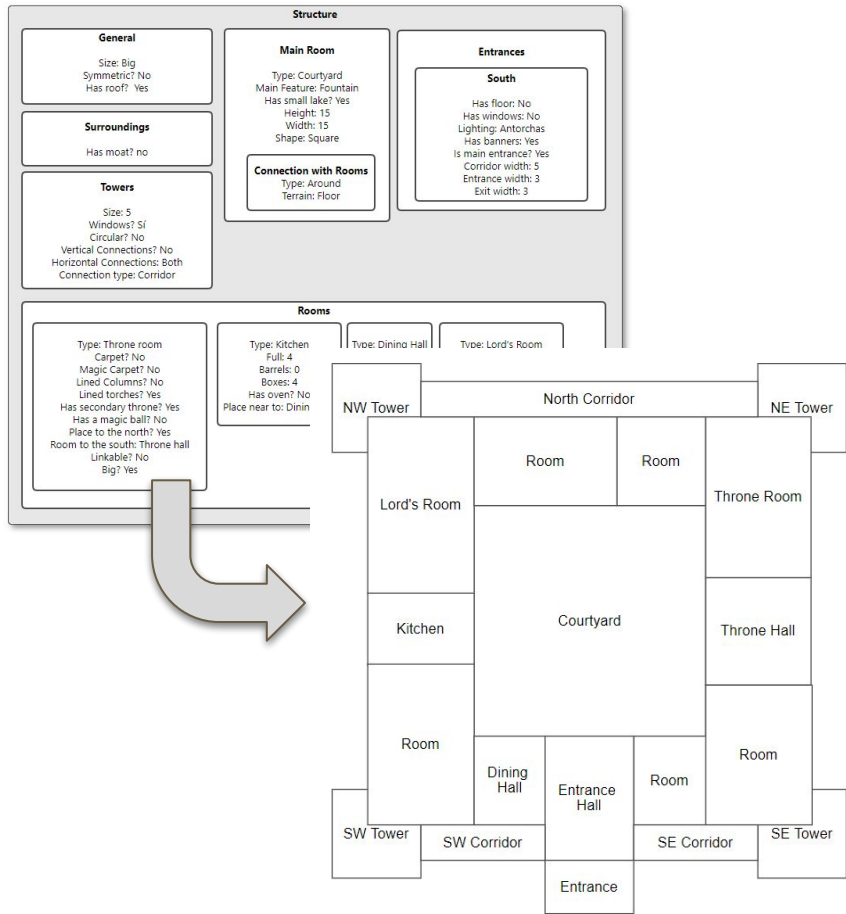
Third Layer

Room Builder

(RoomBuilder.js)

Type: Lord's Room
Piano? No
Clock? No
Library? Yes
Fireplace? Yes
Place to the North? Yes
Big? Yes







Ultima Castle Generator

<http://slashie.net/ultimacastlegen/xp>

Pixel art from RPGMakerXP

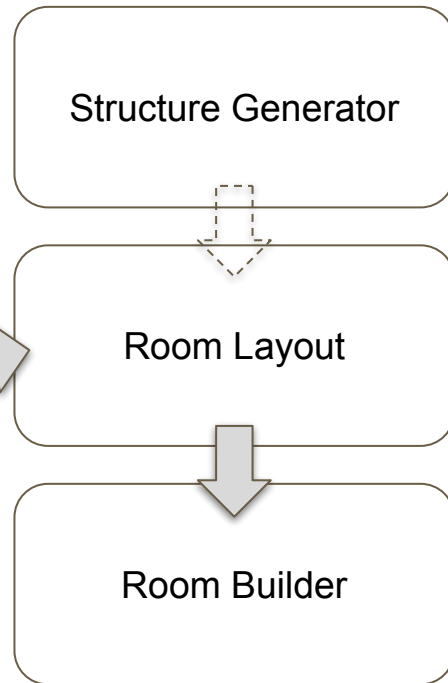
<https://www.rpgmakerweb.com/>

Some advantages of using JavaScript

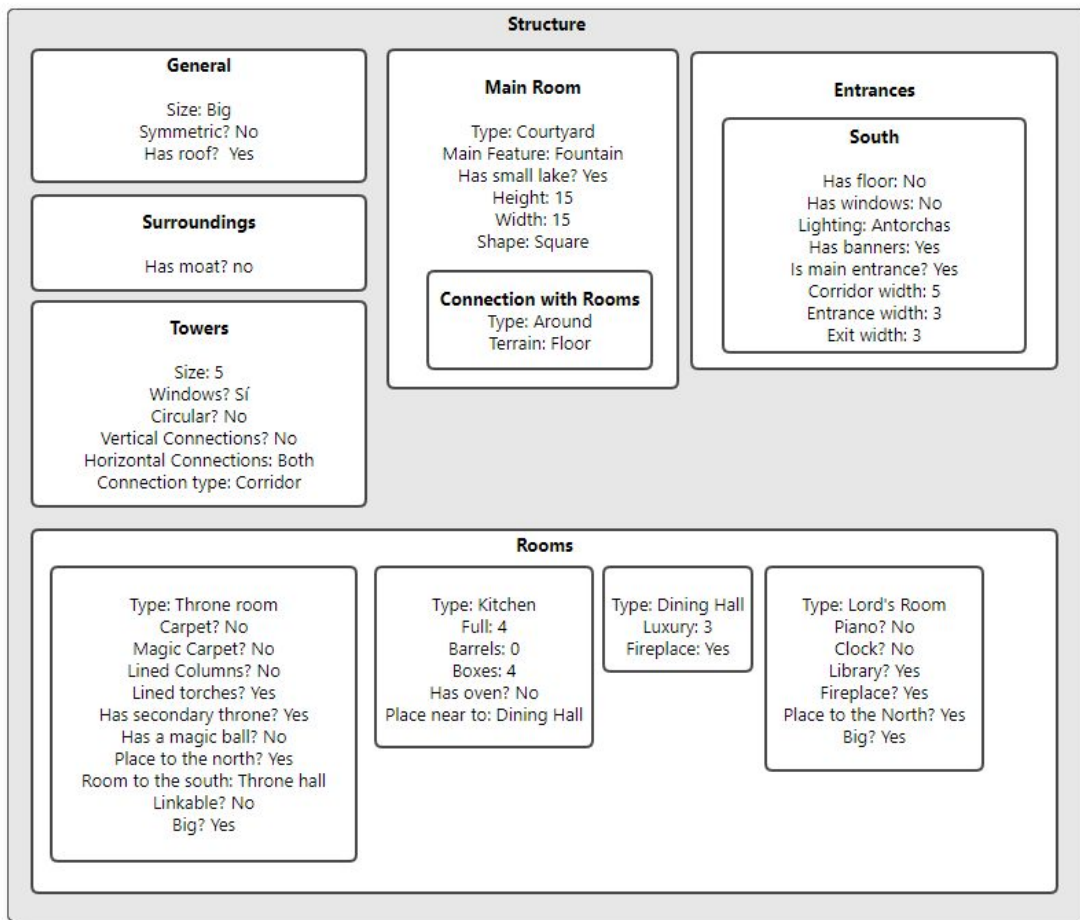
Easier Testing

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      "horizontalConnections": "both",  
      "connectionCorridors": {  
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      }  
    }  
  }  
}
```

JSON Data



Flexible Communication between Layers



Integration with Web technologies



Contact

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<http://slashie.net>