Proof of Correctness of Generation of Dungeon

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Date: February 06, 2022

Existance of the Universe and Related Objects

Suppose a cartesian product of $\mathbb{R}$ and $\mathbb{R}$ called the **dungeon grounds**.

Suppose a collection of data called a **room** such that for any room:

$$\text{room} = \{\text{room}_1,\ \text{room}_2,\ \ldots,\ \text{room}_n,\ n,\ \text{shape},\ \text{depth}\}$$

Where $n,\ \text{depth} \in \mathbb{I}$, and shape is defined to be:

$$\text{shape} \begin{cases} \text{square} \\ \text{circle} \\ \text{line} \end{cases}$$

Such that { is representative of inheritance of objects (parent left, children right). Where square, circle, and line are all sets defined as follows:

$$\text{shape} = \{\text{co\_center} \mid \text{co\_center} \in \mathbb{R}\}$$

$$\text{square} = \{\text{shape},\ \text{height},\ \text{width}\}$$

$$\text{circle} = \{\text{shape},\ \text{radius}\}$$

$$\text{line} = \{\text{shape}, \text{r1},\ \text{r2},\ \theta\}$$

Suppose some $\lambda \in \mathbb{R}$.

Dungeon Generation

Suppose some dungeon grounds.

In reference to a particular room the notation: $\mathfrak{R}_k$ such that the member $n = k$ for any shape.

The generation of a room is to be determined by executing this following process:

Find the probability of generating a new generation of rooms given an expoenetial distribution with parameters λ, depth.

Choose to either generate a new generation of rooms or stop with the current room based off the probability determined by the expoenetial distribution.