MMCC2041 - Website Content

The Building Blocks:
Procedural Generation:
Constructive Generation:
Benefits of Random Generation:

Generation Implementation:
For this example, procedural generation will be applied and implemented using C# and the game engine

While dungeon generation can be implemented in a multitude of ways, in order to properly grasp the understanding required to create a visually appealing and functional system, the desired outcome must be well designed and reproducable. For this implementation, a set of rules or design specs will act as the 'floorplan' for the generation algorithim to replicate and follow. These rules create a boundary as a way to shape the Algorithim and hold back the system from falling to infinite loops and infinite generation.

These set of rules can be stated as:

2D array initialized to act as a Grid for the dungeon.
Place the "Spawn room" in the middle of the (grid. grid.length / 2)
Update and get list of active neighbouring cells in the grid.
Determine neighbour cells by adding +1/-1 to x or y axis of the selected cell.
If neighbour cell is occupied, fail attempt.
If neighbour cell has more than 1 already occupied neighbour, fail attempt.
If the max amount of rooms have been created, fail attempt.
Rooms have a 50% spawn rate.
Spawn rate check, if true, add neighbour cell to active list.
Repeat 3-9 till the max amount of rooms have been created.

While these rules may govern the generation for the default floorplan and "Normal rooms", we also have the ability to add more variety and and instill a sense of wonder and exploration by adding "Special rooms". These special rooms will have separate rules applied along with unique functionality. These special rooms typically take the form of hidden loot rooms, boss rooms, shops, or even challenge rooms. For this implementation however, only a shop room and boss room will be added.

Special rooms have a 25% spawn rate.
Special rooms cannot be connected to the spawn room. Cannot be within a +/- 2 radius to the spawn room.
The "Boss room" must spawn on the outskirts of the generated cells in the grid. A max neighbours of 1 is allowed.
The "Shop room" must spawn where there is a connection of 2-3 neighbouring rooms.

Click to access code.

References:

- Background:
  - https://twitter.com/CamiUnknown/status/1420121796251209730
- Theory:
  - https://slsdo.github.io/procedural-dungeon/
  - http://antoniosliapis.com/resources/
  - https://www.researchgate.net/publication/309279824_Constructive_generation_methods_for_dungeons_and_levels
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