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CP 411
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Pebble's Game of Life

Description:

The purpose of this project will be to recreate the famous "Conway's game of life", a cellular automaton devised by the British mathematician John Horton Conway using OpenGL. This version of the software will play out the cell simulation on planes and 3d objects.

Design:

The project will be designed with the following function states in mind:

- 2D Mode
  - User are able to draw cells on the screen before beginning the simulation
  - Users are able to watch the simulation play out
  - Users are able to select a color from a color wheel, rainbow or heatmap to distinguish cells.
  - Designed using the Orthogonal 2D viewmode

- 3D Mode
  - Users are able to select from a set of shapes to run the simulation on
  - Users are able to watch the simulation play out on the selected 3d object
  - Cells are generated using a procedural algorithm
  - Users can input a seed to influence the procedural algorithm
  - Users can also display an image created in 2D mode in 3D Mode
  - Designed using the Frustum 3D viewmode
  - User can select different coloring mode for the cells similar to the 2D mode

Implementation plan:

Structs

cell	Int oldState Int newState Int age
cellMap	Int size cell cells[][]

Objects

Name	Methods	Properties
Doughnut	Draw	cellMap map;
3DCell	Draw Set Position	Cell cell Vertex position
cellMap3D	Draw	Const size Cell cells[][][]
Light	setPosition setRotation	Vertex position
Camera	setPosition setRotation	Vertex position
Vertex	setVertex	Double x Double y Double z

Schedule

Finish 2D implementation with random cells	Nov 23rd
Finish custom cell function	Nov 25th
Volumetric Cube with random cells	Nov 27th
Doughnut with random cells	Nov 29th
3D procedural algorithm and seed input	Dec 1st
Graphics polishing	Dec 3rd
SQA	Dec 4th
Deadline	Dec 5th

References

- Computer Graphics with OpenGL Fourth Edition
- Conway's game of life ~ John Horton Conway

Tools

- Github
- Eclipse Oxygen