CS 51 – Spring 2016

Final Project Proposal

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**Title:** the-o-maze-ing-caml

**Objective:** To create an OCaml-based application that generates perfect mazes.

**Project Goals/Implementation:**

* Take advantage of OCaml’s functional paradigm to implement the recursive division algorithm for generating a perfect, rectangular maze.
* Utilize OCaml’s Graphics Module to display the maze on the user’s screen.
* Structure:
  + Maze module: data types for maze - grid and cells; create maze function - divides a grid with specified coordinates, width, and height using the specified resolution; draw maze function
* If extra time permits:
  + Functionally program the reverse backtracking algorithm to provide solutions for the generated mazes
  + Create mazes of different shapes (i.e. circular, triangular, etc.)
  + Implement other maze algorithms (Prim’s, Kruskal’s, etc.) and compare relative efficiencies/performance

**Division of Labor:**

* We will divide the tasks of our project based on the abstraction barrier (creation of module / implementation of module).
* Alex – create a module with functions that takes in the coordinates of a rectangle and subdivides the rectangle into four other rectangles, while also poking walls in three out of the four generated walls. This is a single, iterative step of the recursive division algorithm.
* Melissa – recursively call the module’s functions to generate the maze. This is the recursive part of the recursive division algorithm.