**Programming Project Report**

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**Problem Statement:**

The goal of this programming project is to create a retro video game in OpenGL. The player will explore a 2D maze to find and collect hidden treasure. In this project, the tasks were split into two different projects. The first one, this one, is to create and display the 2D maze made of texture mapped cubes.

**Design:**

For this programming project, I used Dr. Gauch’s texture3 as starting code. I chose to use vectors, class, and struct for this assignment, as the vector would allow it to stretch to any size of map wanted. An example of each is shown below:

enum class wallType {

rock,

brick,

wood,

empty

};

struct wall {

wallType type;

};

vector<vector<wall>> map;

For reading in the maze.txt file, I used a switch statement inside of a double for loop.

**Implementation:**

To start this assignment, I started by reading in the maze.txt file. I first tried using an array, but to no avail. I had to switch to vectors. After reading in the file and having the map set, I moved on to building it. I noticed that init\_texture was only called in block using the brick.jpg, so I moved part of the initialization to inside of the block function and allowed a string to inserted so any jpg can be used. After that, I then created a function to draw the maze. It was pretty simple.

void drawMaze() {

glScalef(0.25, 0.25, 0.25);

for(int i = 0; i < xLength; i++) {

for(int j = 0; j < yLength; j++) {

block(i, j, -0.1, i + 1, j + 1, 0, "grass");

switch(map[i][j].type) {

case wallType::brick:

block(i, j, 0, i+1, j+1, 1, "brick");

break;

case wallType::wood:

block(i, j, 0, i+1, j+1, 1, "wood");

break;

case wallType::rock:

block(i, j, 0, i+1, j+1, 1, "rock");

break;

case wallType::empty:

break;

}

}

}

}

**Testing:**

For testing, the only inputs that were allowed were x, y, z, r, and t. At the end of the assignment, everything was working as expected.

A screenshot of a video game

Description automatically generated

**Conclusions:**

Overall, this project was a success. The program displays a 2D model of a map from a text file. This project probably took about three days to complete, with most of the time spent trying to figure out how to properly use the vectors and struct.