

# TJ Hall Modeling

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#### Abstract

The purpose of this project is to create a simulation of the students and teachers at Jefferson moving around the building. This simulation is meant to be accurate based on time and location. The program is coded in Java, using MASON, which provides the appropriate graphic output interface. The simulation allows the user to play and pause the simulation, to start it over, or to initiate a fire drill.

#### Background/Introduction

The idea behind modeling is to create computational devices and then simulate them to model real phenomena. One of the first such simulations was John Conway's Game of Life. A great deal of research has been done on this topic before. One of the examples I looked at was a traffic jam simulation in a city. The project made some discoveries about human behavior. Humans tend to optimize their behavior by avoiding collisions with obstacles and with other humans. The humans in my program will avoid obstacles and will be able to keep themselves away from danger.

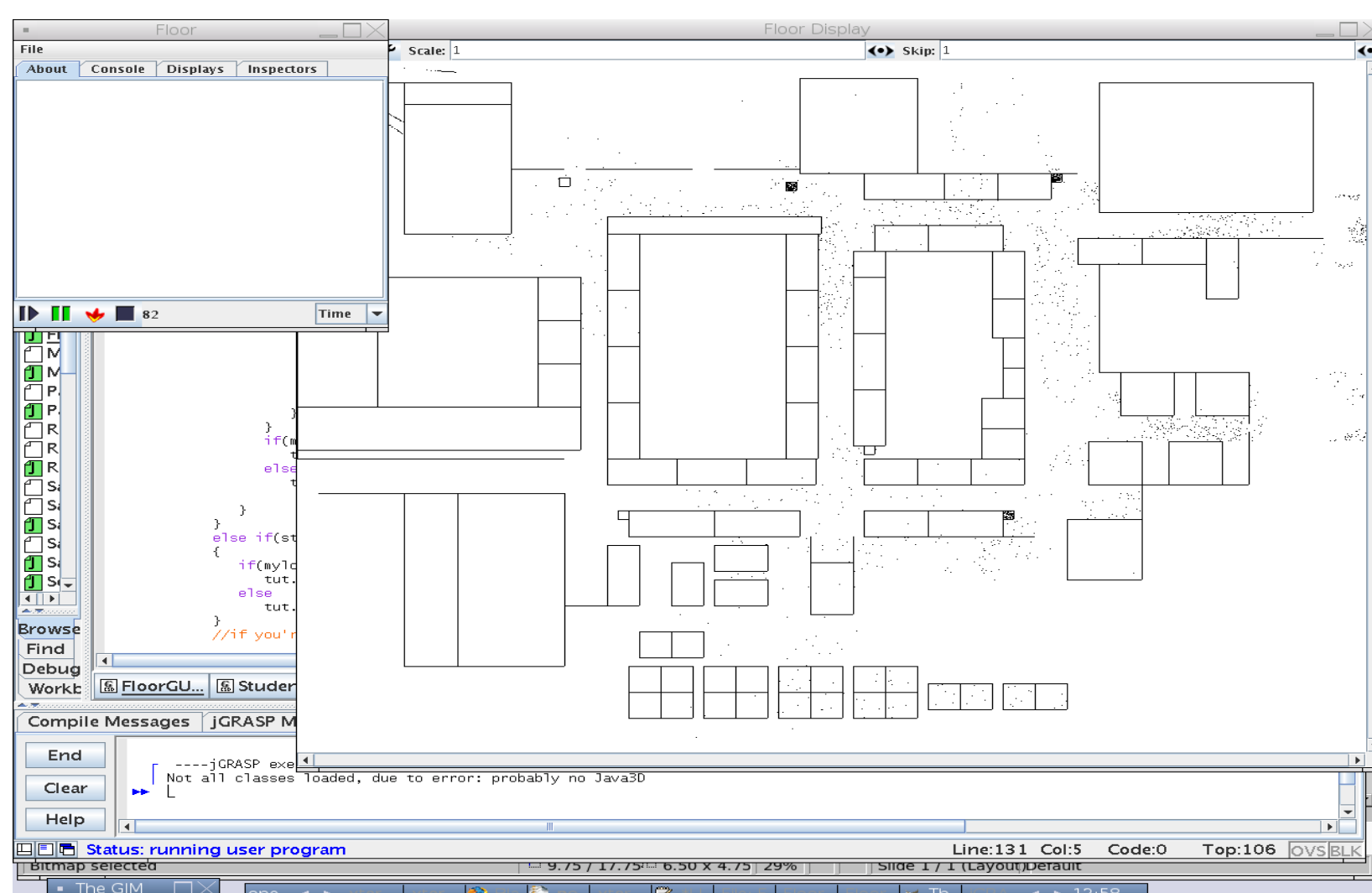
#### Procedures and Methods

This project started as a MASON tutorial and became a simulation of TJ students moving through the school. I created an input file that stored the locations of the walls and rooms. The program would read in this file and display the rooms and walls to the screen. I later added special rooms to take care of the fire drill procedure. The student dots are capable of starting in one of five locations that reflect the areas students generally come from at the start of the school day. The students follow real schedules, which are also read in from an input file, as they go through their day. Students may get to class early, on time, or late. In theory, no student should be late unless he is an extremely slow walker or there is a glitch in the program. Each student has a randomly generated step size to account for different real gaits. The user also has the option of pressing the fire drill button, which will activate the fire drill procedure and students will move to their assigned locations for a fire drill.

#### Results and Conclusions

The result should be that over the time line of the simulation, a typical anchor day, the dots will behave according to specified formulas; mainly probabilities and defined schedules. From this, one should be able to recognize which hallways need to be avoided and how to get around quickly during breaks, something that may be useful to students. The fire drill simulation may also be of aid to administrators.

First Floor



Second floor

