

*COS 116*  
*The Computational Universe*  
**Laboratory 5: Controlling the Robot II**

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In this lab you'll write more pseudocode to control the robot. Today's challenges are more open-ended than last time's. There are many ways to solve them, so try to start brainstorming early. **Remember to bring your Scribbler and its cable to the lab!**

**Hand in your lab report at the beginning of lecture on Tuesday, March 14. Include the programs you wrote. Briefly analyze how well they worked, and write about any problems you needed to overcome. Also, save a copy of your Part 2 program (use "File -> Save As ..." in the Scribbler Control Panel), and email it to David (dxiao@cs.princeton.edu).**

### Part 1: Navigating a Maze

Teach the robot to escape from a simple cardboard maze. (Refer to page 2 for a diagram of the maze.) We will test your solution by placing Scribbler at a random location within a designated starting zone. This means the robot must use its sensors to navigate. We'll give points for a successful escape and for reliability in repeated tests.

### Part 2: Scribbler Art

Now it's time to get creative. Working alone or in a team, write pseudocode to show off the Scribbler's artistic side. Here are a few suggestions for inspiration, but the possibilities are nearly endless. Check with your TA if you have another project idea.

- *Music*: Program a song with the sound commands. This web site lists the frequencies for musical notes: <http://www.phy.mtu.edu/~suits/notefreqs.html>. You might have several robots play different parts to achieve harmony.
- *Dance*: Use motion commands and loops to teach Scribbler a simple step. If you're working in a team, have another robot serve as a dance partner or provide a beat.
- *Drawing*: Give Scribbler a pen and let it run wild. Give the robot a fixed drawing path with motion commands, or combine motion with coin tosses for something more abstract. If you want, bring several different color pens and other kinds of paper.

We'll give 50% of the points for entering anything that works. The remaining 50% will be awarded for creativity (but we'll be generous). The best entry or entries will be shown in lecture.

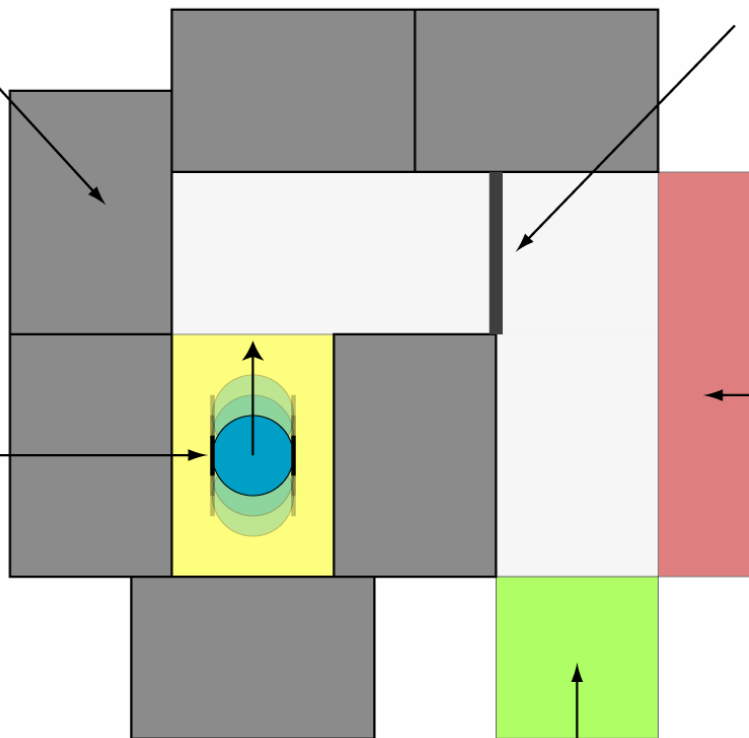


Obstacles block the robot's path.

A heavy black line will warn the robot as it nears the lava.

Scribbler will start facing north at a random position in this region.

To the east of the maze is a pool of lava. The Scribbler will be destroyed if it strays into this area.



The robot's goal is to reach the maze exit, represented by this square.