

L00: CSC 126, Introduction to Robotics

This is a team assignment designed as an in-class activity.

Directions for sharing

- Please change the document name so that it is *L00_Lightbot_yourusername*.
e.g. *L00_Lightbot_pearcej_wilbornew*
- One person should make a single copy of this worksheet in their Google account.
- Then that person should share it with everyone in the group so they can all edit it.
Note that having access will be essential for studying for exams.

Member Roles

- If you have three people be sure to rotate through all three instead of using odd/even.

Team Roles	Member Name
Odd Level Player “Drives” at the keyboard on all odd levels, listening to partners. Facilitator: Keep track of time and make sure every player contributes and learns equally.	
Even Level Player “Drive” at the keyboard on all even levels, listening to partners. Reflector: Consider how the answers could be deeper, and how the team could work and learn more effectively so everyone learns	
Third member: Drives every third time. Actively comments on all ideas and code.	

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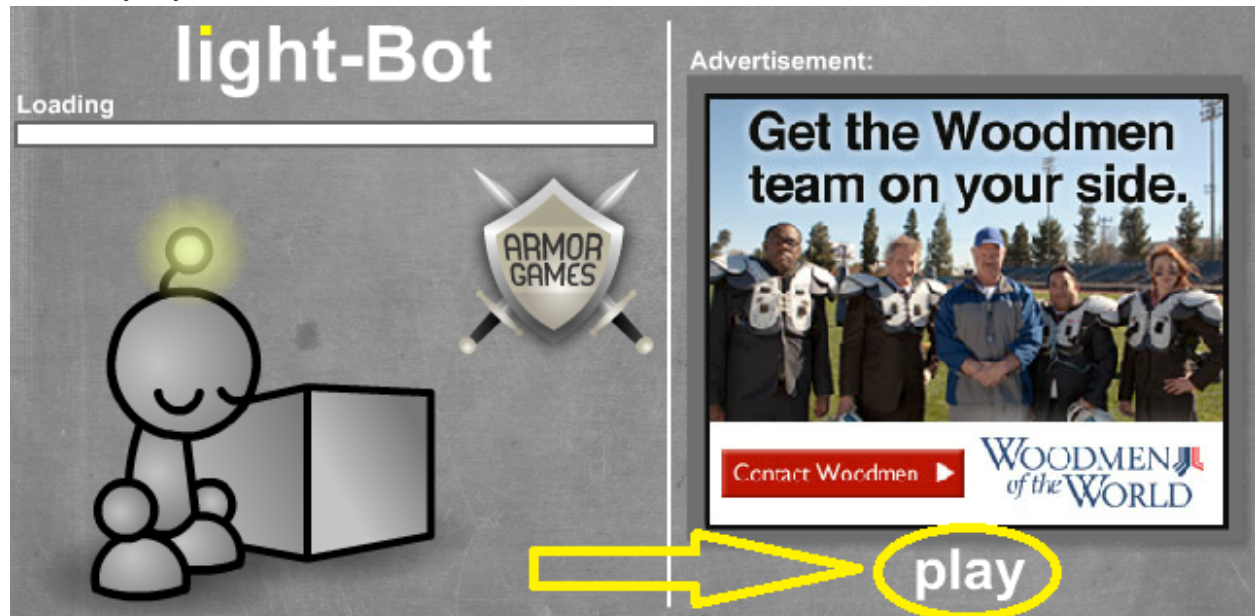
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Lab Activity

1. (2 min) Discuss with your partner(s) what you believe the motivation is for the roles and jobs described above, and write what you think are the main advantages for committing to the above roles.



Next, you will work with a partner to play at least 8 levels of a game called Light Bot (<http://armorgames.com/play/2205/light-bot>)

The first screen is a bit confusing. Even if it keeps saying that it is loading, just push the play button anyway.



Use only one laptop for playing and one for reporting, switching laptops after each level so that each person is able to “drive” every other time, not forgetting the facilitator and reflector roles.

2. (4 min) Level 1:
With the Odd Level Player at the keyboard, play Level 1.

Level 1 is focused on  and  command icons. Briefly describe what the robot does when each command is executed.

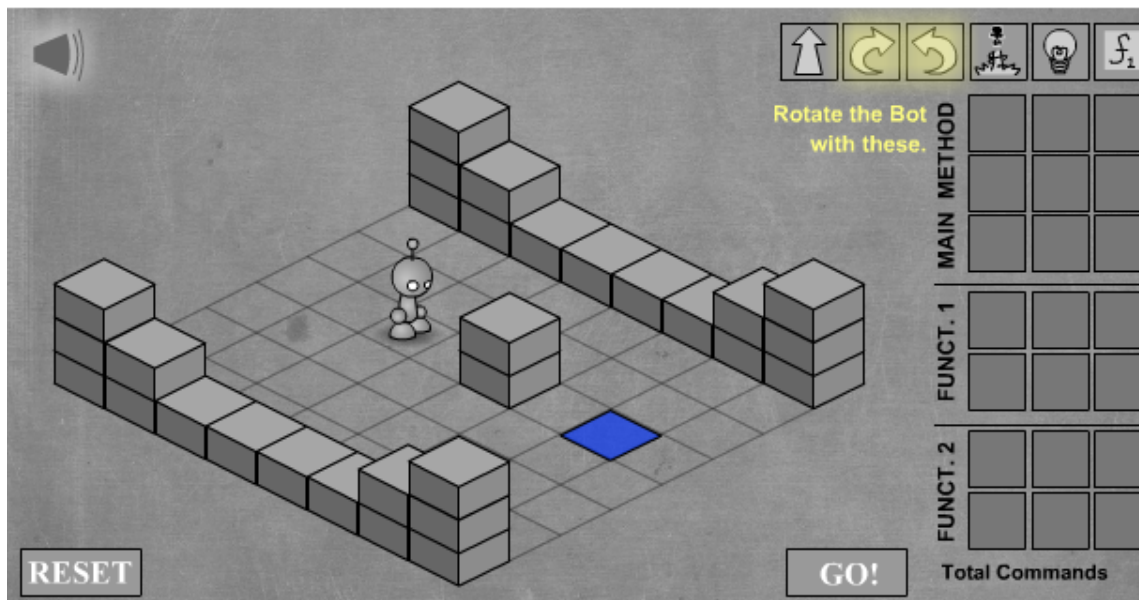
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3. (3 min) Level 2:

Change laptops so the Even Level Player is at the keyboard.
Then Play Level 2.

Level 2 is focused on using  and  command icons. Briefly describe what the robot does when each of these new commands is executed.



4.

(4 min) There is more than one solution for the Level 2 Challenge (board shown above). Describe all of the changes you would need to make to the solution you found so that you have a different solution that still works correctly.

5. (? min) Keep playing the levels by passing the keyboard back and forth until your team makes a mistake that makes the robot go the wrong way. Push “Stop”, so you will be able to see your code and reflect on it. Please be honest. Mistakes of this type are normal! Discuss why your original code did not work and describe what you each learned from this mistake. Be sure to write a full paragraph that includes the learning of all team members.

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6. (5 min) Recent brain research on making mistakes indicates that mistakes are hugely important for learning. In fact, making a mistake is an opportunity for celebrating and reflecting on the mistake because mistakes are not only opportunities for learning, but when we think about a mistake and what we learned from it is also a time when our brains actually grow.¹



Did you and/or your partner know that making mistakes is critically important to learning? What are your thoughts about this fact? Do you already celebrate mistakes or do you think you can learn to celebrate your mistakes? Explain.

7. (? min) Keep playing the levels by passing the keyboard back and forth through at least level 8. Take a screenshot of your highest level achieved.

8. (0-1 min) In a single sentence, briefly describe what the robot does when the



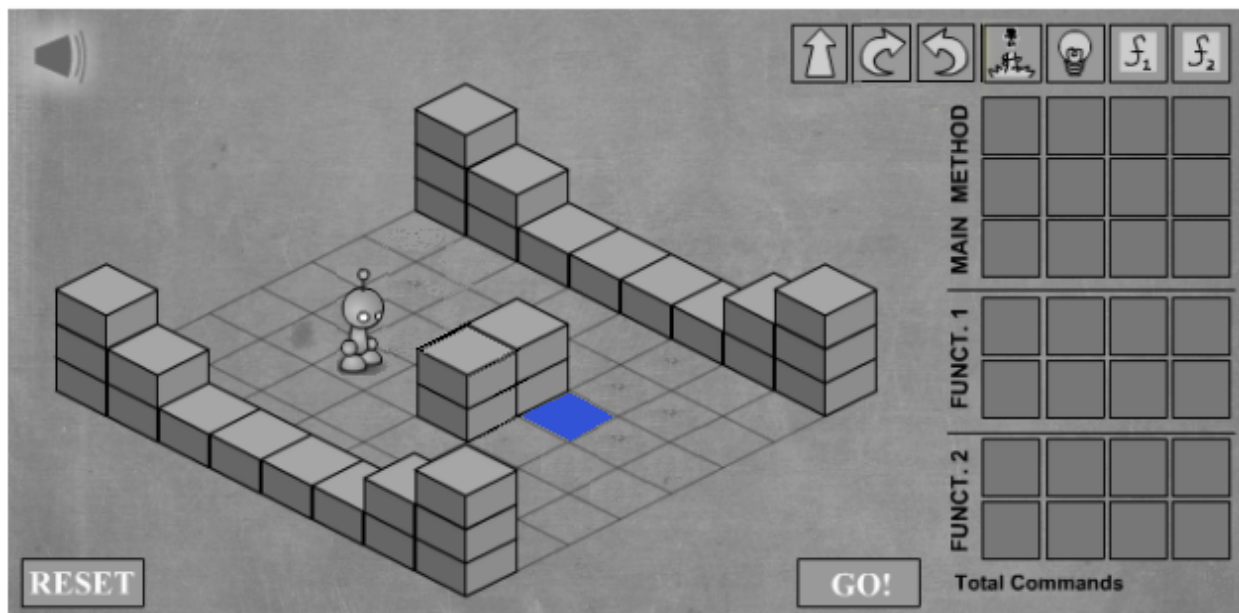
command is executed. Be sure all teammates agree.

8. (5 min) The command icons  and  are called *functions*. Discuss how you used them and describe in detail what a function seems to do and how it is useful in programming.

¹ See Mistakes Grow Your Brain <https://www.youcubed.org/evidence/mistakes-grow-brain/> for more detail.

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9. (10 min) Consider the three programs shown in the images below. Identify which (if any) of the following programs would get Lightbot to the goal square identified in the game above. Explain how you know this/these is/are correct program(s):

10. (10 min) If one or more of the above programs given in the image gets Lightbot to the goal, it still might not be an optimal program. An optimal program is one that uses a minimum number of instructions. Write an optimal program to get Light Bot to the goal.

Use: (via control-C to copy)

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11. (1 min) Most students report that it is helpful to work in a team for this activity. Did you find it was helpful to have a team for this activity? Explain in several sentences by each partner.

12. (2 min) One of the key ideas in computer science is to be able to take a large problem, break it down into smaller parts, and then design solutions and test those smaller parts. Did you find this was a strategy you ever had to employ with Lightbot? If so, give an example, and briefly explain in a single additional sentence.

13. (2 min) Discuss in your team what you think is the most important thing you learned in today's lab. Briefly summarize your discussion in a single paragraph of several sentences that represents all team members

To Earn Credit

- Everyone in the team is to download their copy of this document as a PDF and submit it to Moodle before the deadline.
- **Please note:** Your submission in Moodle means that you were fully involved with all of the work and all of the thinking described above. If you submit work in which you were not wholly a collaborative participant, not only will you not have done the learning needed for the exams, it will be considered academic dishonesty and will be treated as such.