



Get Logical!

Lesson 3: Intro to Logic Programs >
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Name:

Date:

School/Subject:

www.thingiverse.com/thing:1708240

In this activity you will learn how to use simple logic commands with Arduino in order to get your robot to avoid obstacles and autonomously travel around a room or even find its way through a walled maze.

The difference with this lesson will be when you have to think things out and create your own codes to complete your tasks

1. Step One – Set up motor commands: like you have done in the past lesson, create some programs for “forward” “turnL” and “turnR” based on these lines of code from lesson one:

```
Lservo.write(?); // set servo speed 180 = Fast Forward // 0 = Fast backwards // 90 = Stopped  
Rservo.write(?); // set servo speed 0 = Fast Forward // 180 = Fast backwards // 90 = Stopped
```

you will have to experiment with delays and the “brake” command to get your Left turns to be as close to 45 degrees as possible and you your Right turns to be as close to 90 degrees as possible after you add your programs to the bottom of the code. To do so the loop should look like like this:

```
void loop ()  
{  
    turnL();  
    brake();  
}
```

2. Step Two – Record Results: Record results for a 45 degree Left Turn, a 90 degree Right Turn, and Full Speed Forward in a straight line (may have to adjust a number to go straight)

```
void turnL () {  
    Lservo.write(      );  
    Rservo.write(      );  
    Delay(      );  
}
```

```
void turnR () {  
    Lservo.write(      );  
    Rservo.write(      );  
    Delay(      );  
}
```

```
void forward () {  
    Lservo.write(      );  
    Rservo.write(      );  
    Delay(      );  
}
```

3. Step Three – If – Then – Else: With an “if” command you have already found out that you can allow your robot to think (well kind of). You can also add an “else” command after it to have your robot do something if the opposite happens. It would look like this:

```
void loop ()
{
    If {
    }
    else{
    }
}
```

4. Step Four – Create an if – else command: Create a set of commands in a loop that will allow babySCRU-FE to move forward if nothing is in from of it, else it will go back 15 cm, turn 45 degrees to the left and then go through the loop again!

Correctly write out and submit this code to your instructor for a grade of an A!

5. Step Five - CHALLENGE– Multiple If -Else Commands! Can you find a way to put an extra If/Else command in your program to make it so that babySCRU-FE will turn 45 degrees to the left when there is something in the way, and if there is still something in the way the robot will turn 90 degrees to the left and then go through the loop again.

If you complete this correctly, write out your full code and submit it for a grade of an A+!

PROGRAMMING UNIT 1: GRADING RUBRIC

60-65	65-80	80-90	90-95	95-100
Robot not able to be coded or moved in any way for lack of trying or code is copied or plagiarized.	Robot motor movement is able to be coded only for motor testing. No working codes for ultra sonic sensor.	Ultra sonic sensor works to move the motors, but does not move the motors in the assigned ways.	Step 4 of Lesson 3 is completed successfully, and the If – Else Command is understood.	Step 5 of Lesson 3 is completed correctly and student has mastered the use of multiple If – Else commands!