

Part Selection

16-311: Introduction to Robotics

Contents

Learning Objectives	1
1 Mobile Robot [30 points]	2
2 A3 Talk [20 points]	2
3 Microcontroller [50 points]	3
What To Submit	3

Learning Objectives

1. Implement practical robotics skills to robotics components.

1 Mobile Robot [30 points]

Imagine you are creating a mobile robot designed serve food to patrons in a restaurant. For each question below, provide a URL to a part (if applicable) and EXPLAIN your selection in at least one sentence.

1. Which wheels will you choose?
2. Which motor(s) and gearbox will you select? Imagine your robot weighs 25 lbs without food and 35 lbs fully loaded.
3. Which battery will you choose?
4. Which sensors do you think would be helpful for your robot? Choose at least two.
5. Assuming that each device is compatible with the four types of communication protocol that we discussed, which one would you want to use?

2 A3 Talk [20 points]

Answer the following in two to three sentences.

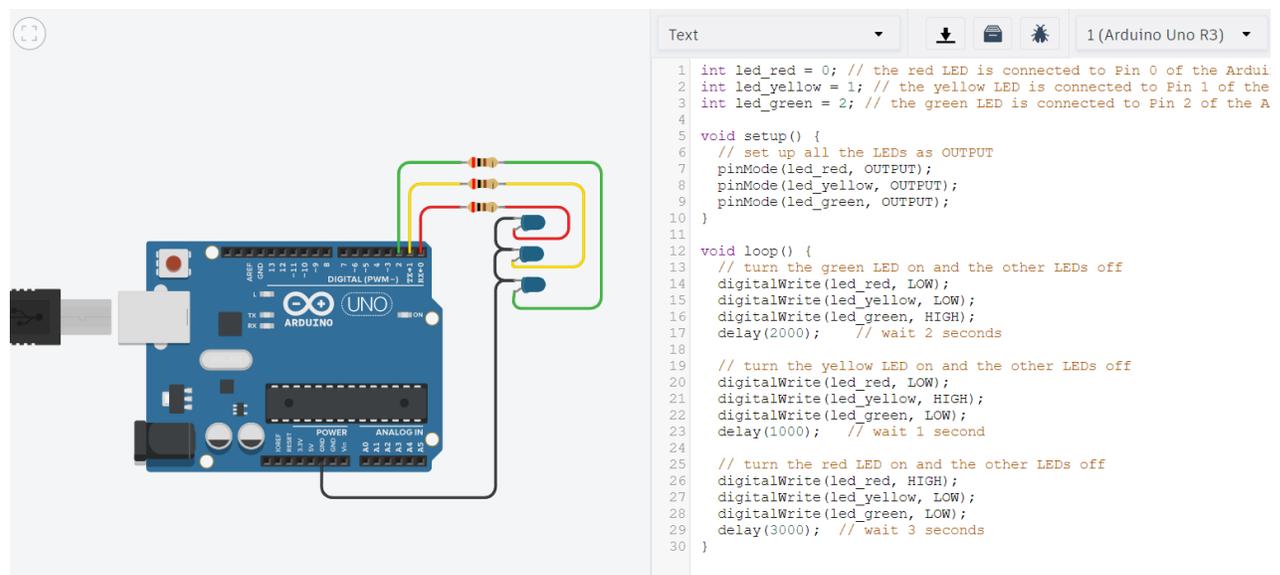
1. What did you notice about the design of the Aethon hospital robots compared to the Mobile Industrial Robot factory robots?
2. One of the questions posed during the A3 seminar was something to the effect of "when will a robot drive to my doorstep and hand me my package?" This sort of question is typical in robotics. Many consumers seem to be waiting for the robots that have the same capabilities as human workers. Do you think we will ever get there? Have we gotten there with some caveats?

3 Microcontroller [50 points]

Using any circuit diagramming and coding software, design a circuit and program that lights up a light inversely proportional to how much light is shining on a photoresistor. Make sure to include necessary sensors, resistors, and a microcontroller.

Never designed a circuit before? You can make a free individual account or use existing Google account on tinkercad.com. Once you create an account and go through the tutorial (or skip it), you can go to the circuit tab where you can create a circuit, write code for an Arduino, and simulate it.

Take a picture of your circuit and code and include it with your writeup like the image below. If you used a simulation program, you can also include a video.



What To Submit

Submissions are due on Gradescope by the date specified in the Syllabus.

1. Create a .pdf file with the written answers ALL THE SECTIONS.
2. You should have the answers to 7 questions, a picture of a circuit diagram and a picture/copy/link to the code for the microcontroller.