Real-Time Systems
Lab 2: The Plot Thickens
Due: January 26, 2017 (Before Class)

Experiments

Now that you've played around with the basics of the Ringo, it's time to see how creative you can get. This is the stage where you have free reign to write code that does whatever you want. However, that doesn't mean that you can turn in a halfhearted project you wrote up in half an hour. Put some thought into this. This will also require you to read through the functions provided for you by PlumGeek. You can also take a look at the function implementations because you'll eventually have to implement your own version of many of those functions that are timing-safe.

Your Ringo demonstration must include a minimum of 4 different aspects: visual, auditory, motor, and sensor. In other words, your code has to make the Ringo move, make noise, do something with its lights, and change its behavior based on readings of some sensor. 2 of these behaviors must be periodic tasks, 1 must be an aperiodic task, and 1 must be a sporadic task. You can expand on what you've created in Lab 1 if that suits these requirements.

Although in the next several labs the tasks you write for this lab won't play a role (that is, you can remove the behavior), in lab 7 you will need to incorporate these tasks back into the RTS.

What to submit

1. **(35 points)** Zip the entire Arduino project so that we can just unzip and execute the source code.

   - If you have built on the previous lab's tasks, provide a diff of source code. Please use a "diff" tool of some kind that highlights the changes from previous files (e.g. `https://www.diffchecker.com/`, meld, github, etc.)

2. **(30 points)** Documentation of the task(s) you have implemented for this lab. (0.5 - 1 page long)

   - Clearly state what you have done with each aspect (visual, auditory, motor, and sensor).
   - Describe each implemented task and the behavior expected to be observed from that task. Classify the tasks into periodic, aperiodic, and sporadic, and provide justifications on why a task is of a certain type and what were the thoughts while deciding the frequency of the tasks.

3. **(35 points)** Record a short video of the robot performing the task with clearly observable behaviors from all the three aspects.

   - Please upload the video to YouTube, Vimeo, or something similar and then provide me with a link. Just put the link somewhere in the writeup you did in #2 above.

4. Upload all of this into "handin" at `https://cse-apps.unl.edu/handin`