This is a repeat of Project 4 that had you come up with the final project.

Pick a project that uses either the three wheeled (one is the caster) robot car or the two wheeled balancing Segbot. Tell me what sensors and actuators you will use and play with. These can be the ones already given to you: microphone, MPU-9250, optical encoders, joystick, real-time clock chip, RC servo, DC geared motors attached to wheels, buzzer, LEDs, DAN28027 board. There is also a Relay and spots for higher current transistors on the board that could be used for turning on and off a higher current device like a two position solenoid. I have Orange Pi Zero boards (knock off of a Raspberry PI) that I am willing to give you if you want to have an even more challenging final project. (I have same code and I will do my best to help you with this board but time is short so you will have to do your own reading on how to program in Linux for this board.) I also have some ESP8266 boards that add slow WIFI to your robot. It is a UART to WIFI board. I have a bit of example code but note that getting these working will take a bit of extra work.

In addition, I have some sensors you can use for the project but you will not be able to keep at the end of the semester:

1. USB camera that you can connected to the Orange Pi Zero only.
2. IR distance sensors excellent for wall following.
3. I have 8 total LIDARs. Talk to me quickly about these if you want to use on for your project, but know the LIDAR will add some difficulty to your project.
4. You can also purchase other sensors and actuators but make sure I approve the item before you purchase it.

Here are some ideas for projects. You do not have to pick one of these.

- Play with MPU-9250 registers and Compass. If you want to play with the Compass I suggest you pick the robot car since it lays flat.
- Play with eQEP and unit time capture (an extra feature of the eQEP) and use it to balance the Segbot. You would need to come up with something for the Segbot to accomplish.
- Play more with microphone. Use TI’s FFT library to detect different notes and make the Segbot receive commands by playing notes. Here you could look into the DMA of the F28379D processor.
- Make the Segbot do something. Make gripper with one servo to hold something. Take it somewhere and drop it off.
- Play with a cheap ultrasonic sensor to measure distance. Add it to Segbot or to robot car.
- Make the robot car or Segbot wall follow and avoid obstacles as it is commanded to go from one XY point to another XY point on the floor.
• Make segbot or robot car dance to beat of a song.
• Add bump switches feelers, to Segbot or robot car so can recognize if it needs to backup and turn.
• Steer segbot/robot car with joystick. This would only be a part of your project.
• Add a sensor you own to Segbot or Robot car.
• I do not have any Bluetooth modules but Adafruit has a nice UART to Bluetooth module that you could purchase and add wireless to your robot that way.
• Pick your own project, but talk to me soon so I can approve it or add to it or delete from it.

**Project Submission and Due Date:**

**Project Due Date is Friday May 14th at 5:00pm.**

I would like you to submit your project to the [http://hackster.io](http://hackster.io) website. When you sign up for an account at hackster.io make sure to use you U of I email account. All the projects that are submitted to hackster.io will be judged by our TI representative Mark Easley. There will be six prizes.

First: $100, Second: $75, Third $75, Fourth $70, Fifth $45, Sixth $45.

**Items (minimum) that must be posted at your Hackster.io site:**

• Videos of your project working.
• Video of you explaining what sensors and actuators you used for the project and how they are connected to the Launchpad. Make sure to plug TI and the F28379D Launchpad board.
• Entire source code and Code Composer project files. Make a zip of your project directory in your workspace.
• Number of paragraphs explaining your project.
• If any algorithms used, make sure to explain how they were used and have links to websites or papers that explain the algorithm.
• If you added any sensors, maybe a video of how you soldered and interfaced with the sensor.

If you have trouble submitting your project to hackster.io first talk to fellow students to see if they can help. If you keep on having trouble you do not have to submit your project there, but you will not be a part of the judging. Talk to me about other ways to submit your project and videos if this happens.