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# Problem Set 4

## Introduction

Due on Friday, April 12th, 2019 at 23:59. This problem set has three components:

1. One legged hopper, explained in `set_4_planar_hopper.ipynb`
2. Orbital transfer trajectory optimization, explained in `set_4_orbital_transfer.ipynb`
3. Project Proposals -- see more info [here \(final\\_project.html\)](#)

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Download all components in a .zip

[Download here a .zip with the notebooks and few other important files \(set\\_4.zip\)](#)

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## How to do this Problem Set

First make sure you've [gone through the install instructions \(install\\_drake\\_docker.html\)](#) for Drake + Docker. If you successfully completed previous problem sets, then you should already be set!

This problem set is a little bit different than previous ones in a couple ways, based on feedback we've received and where we are now at in the class:

- The jupyter notebooks are not needed for submission. Instead, the notebooks are only used for visualization and explaining the problem

set. The actual code you will need to write will live inside `.py` files to be submitted.

- The two problems (besides the proposal) are a little bit more hands-on with code, similar to the final parts of problem set 3. Hopefully this will help prepare you as you expand your toolkit or at least give you practice, building up to the final project for the class.

We've also tried very hard to document the args/returns of functions needed for testing, and additionally add print statements in the testing code to help ward off hard-to-parse errors during testing.

To run the notebooks, do this. (Make sure to have the notebook script in your terminal's working directory, and specify the path to the `set_4` unzipped folder)

```
## or use the notebook script for your system
./docker_run_notebook.sh drake-20190331 /path/to/set_4
```

## How to submit this Problem Set

We will use Gradescope to grade the problem set. Information for how to access Gradescope for the class is on the Piazza forum. (Although all course content is open, we only do grading for officialy enrolled students at MIT.)

Please note that you need to make **two** submissions for the problem set.

Those two submissions are:

### 1. Autograded submission

- Upload `hopper_2d.py` and `orbital_transfer.py` to "Problem Set 4, Code Submission" on Gradescope. Don't forget to upload both of them!

- In our testing, Gradescope will give you a grade within around a minute. You can resubmit as many times as you'd like before the deadline -- but be sure to give yourself plenty of time before the deadline to iron out any issues. If you have any trouble, ask on Piazza and we're happy to help you out!

## 2. **Project proposal**

- Upload a .pdf of your proposal to "Project Proposal Upload" on Gradescope.

Please carefully follow the directions for each submission.

Good luck and have fun!

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