AA 274: Principles of Robotic Autonomy
Section 1: VM Installation, Git, Python

Our goals for this section:

1. Install Ubuntu virtual machine locally.
2. Learn how to use Git to pull assignments.
3. Start working with Python and Numpy.

1 Installation

For this class, we recommend using a virtual machine (VM) that we provide which has all the required software preinstalled. Alternatively, you can natively install Linux alongside your normal OS as a dual boot and install the required packages yourself. This may give better performance, especially for graphics rendering. However, as there can be driver issues and other edge cases that can come up when installing linux on hardware, we can only officially support the VM in terms of providing help with your setup. To set up the VM on your computer, follow the instructions here:

`https://github.com/PrinciplesofRobotAutonomy/aa274-docker`

2 Using Git

Git is a source control tool that allows us to share code with you. To obtain code for this section, type the following into your terminal:

```
git clone https://github.com/StanfordASL/AA274_SECTION
```

You will use this folder to store all section material for the remainder of the class. So, to update this repo at the start of each section, type:

```
git pull
```

3 Python

Since our class is composed of students from AA, EE/ME, and CS, we will not assume that you have comprehensive Python knowledge. Therefore, the main purpose of this section is to get your Python coding skills spun up so you can work on the homework. If you know this material already, please help someone who doesn't know it as well.

In order to complete this part of our section, please switch to the scripts included in the code for this section.

Once you have had a look through and are aware of the capabilities that Python offers, complete the following problems:

1. **Define a** $\sin$ **function using NumPy**
2. **Find the minimum of the function using SciPy**
3. **Integrate the function from** $[0, 1]$ **using SciPy**
4. **Plot the function using Matplotlib from** $[0, 2\pi]$

Once you have done this, please submit your results *and code* in one writeup file on Gradescope.