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Theano

**Central Purpose**

The first library I chose to utilize and demo is the Theano library. The purpose for Theano is to define, optimize, and efficiently evaluate mathematical expressions involving multi-dimensional arrays. It is also built off of the NumPy library.

**Useful / Interesting Ways to be Used**

There are a vast variety of options that can utilize this library, since it revolves around mathematics and multi-dimensional arrays. Since it can also define and optimize as well as evaluate these mathematical expressions, the ways it can be used are now seemingly endless. For example, one such way this library can be used involves the calculation and drawing of a slope on a plane. This can be used for calculating the downward speed of an object down the slope shown on the drawing.

Another way this library can be used involves the concept of linear algebra. It can be useful in creating an online, portable calculator for someone’s phone or laptop. A lot of the functions can be used for linear algebra, so creating a calculator for students to use on the go if they do not have a graphing calculator on hand.

**Overview of Functions**

Some of the basic functions for theano include:

1. nnet – Ops related to neural networks.
2. raw\_random – Low-level random numbers.
3. shared\_randomstreams – Friendly random numbers.
4. signal – Signal Processing.

The link to the documentated website is a github website, which is found on the following link: <https://github.com/Theano/Theano>.