Lab 1: Saxpy in "CUDA Python"

- Implement saxpy in "CUDA Python"
- The lab is broken down into four small exercises
- We will provide guidelines and hints along the way
- lab1/saxpy.py

Exercise 1

Host -> Device

- `d_ary = cuda.to_device(ary)`
  - `cudaMalloc(size);`
  - `cudaMemcpy(devary, hstary, size, cudaMemcpyHostToDevice);`

Host -> Device (allocate only, no copy)

- `d_ary = cuda.to_device(ary, copy=False)`
  - `cudaMalloc(size);`

Exercise 2

Kernel Launch

- `griddim`: tuple of 1-2 ints
- `blockdim`: tuple of 1-3 ints
  - 'dim3 griddim, blockdim;
- `a_kernel[griddim, blockddim](arg0, arg1)`
  - `a_kernel<<<griddim, blockdim>>>(arg0, arg1);`

Exercise 3

Device -> Host

- `d_ary.to_host()`
  - `cudaMemcpy(hstary, devary, size, cudaMemcpyHostToDevice);`

Exercise 4

Inside the Kernel

- `cuda.threadIdx`, `cuda.blockIdx`, `cuda.blockDim`
  - `threadIdx`, `blockIdx`, `blockDim`

```
i = cuda.threadIdx.x + cuda.blockIdx.x * cuda.blockDim.x
```