GPU Programming with Directives Exercise
Logging on, Compiling and Running

1 Introduction

The purpose of this exercise is to check you can compile and run simple GPU programs on ARCHER2.

2 Connecting to ARCHER2

Log on to ARCHER2:

```
ssh username@login.archer2.ac.uk
```

Note: for this exercise, it is important to use the `/work` file system and not the `/home` file system:

```
cd /work/project/project/username/
```

3 Compiling and Running

The code is contained in `saxyp.tar`. The tar file can be fetched from GitHub by cloning the course repository with the following commands:

```
git clone https://github.com/EPCCed/archer2-GPU-directives.git
cd archer2-GPU-directives
git checkout 2025-04-22
cd Exercises
```

Alternatively, the file can be found on ARCHER2 and copied into your `/work` directory with the command:

```
cp /work/z19/shared/GPUdir/saxpy.tar .
```

Now unpack the file:

```
tar -xvf saxpy.tar
```

4 Compiling and Running

Since this exercise will involve offloading to GPUs with OpenMP directives, certain modules must be loaded prior to compiling the code:

```
module load PrgEnv-amd
module load rocm
module load craype-accel-amd-gfx90a
module load craype-x86-milan
```

There are two examples, one using HIP and the other OpenMP. To compile and run the HIP example:

```
cd saxpy
make -f Makefile-hip
sbatch hipsaxpy.slurm
```

and similarly for the OpenMP example.