Where we are

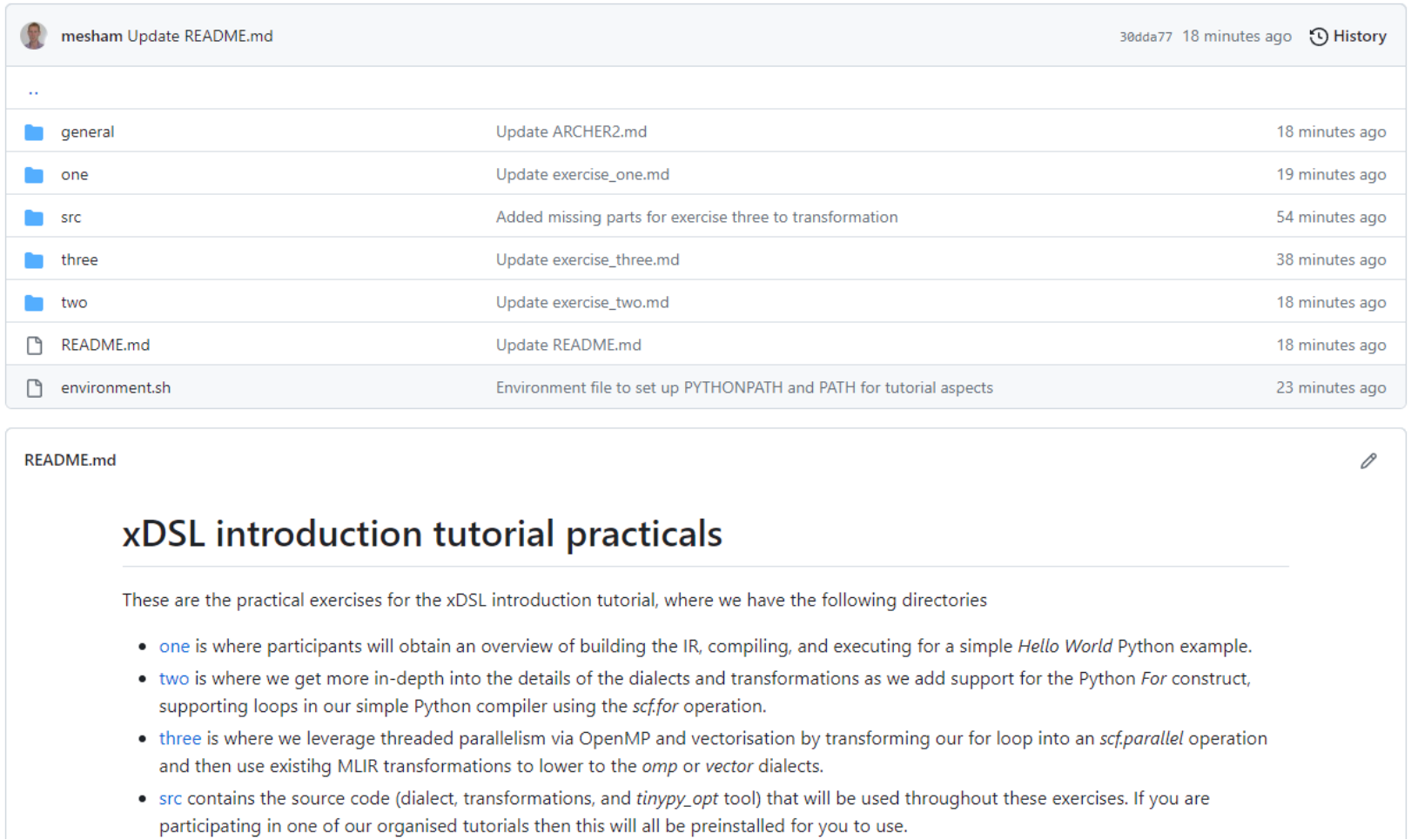
Time	Details	Type
9:00 - 9:05	Introduction, welcome and objectives	Presentation
9:05 - 9:25	An overview of MLIR and LLVM	Presentation
9:25 - 9:55	The xDSL framework	Presentation
9:55 - 10:00	Introduction to the hands-on activity	Presentation
10:00 - 10:15	Logging into ARCHER2 and start hands-on practical activity	Hands-on
10:15 - 10:30	Morning break	
10:30 - 10:35	Welcome back and overview of second part	Presentation
10:35 - 12:10	Continue hands-on practical activity	Hands-on
12:10 - 12:20	Wash up from practical activities, highlighting key take-away points	Presentation
12:20 - 12:30	Conclusions & next steps to continue working with the technologies	Presentation

Hands on activities

- We are going to develop a (very simple) Python compiler, that takes Python code and compiles this to an executable that will run on the ARCHER2 supercomputer (a Cray EX)
  - We will add some threaded parallelism and vectorisation in also as we progress

- The purpose of these exercises is to walk you through using MLIR, LLVM, and xDSL end-to-end, and to firm up the ideas already discussed in the lectures
  - Dialects and how to define our own operations
  - How to apply transformations
  - Development of our own transformations
  - Exploration of the IR
  - Interfacing with MLIR and the options we have there

Practical material



mesham Update README.md — 30dda77 18 minutes ago — History

..		
general	Update ARCHER2.md	18 minutes ago
one	Update exercise_one.md	19 minutes ago
src	Added missing parts for exercise three to transformation	54 minutes ago
three	Update exercise_three.md	38 minutes ago
two	Update exercise_two.md	18 minutes ago
README.md	Update README.md	18 minutes ago
environment.sh	Environment file to set up PYTHONPATH and PATH for tutorial aspects	23 minutes ago

README.md

xDSL introduction tutorial practicals

These are the practical exercises for the xDSL introduction tutorial, where we have the following directories

- one is where participants will obtain an overview of building the IR, compiling, and executing for a simple *Hello World* Python example.
- two is where we get more in-depth into the details of the dialects and transformations as we add support for the Python *For* construct, supporting loops in our simple Python compiler using the *scf.for* operation.
- three is where we leverage threaded parallelism via OpenMP and vectorisation by transforming our for loop into an *scf.parallel* operation and then use existihg MLIR transformations to lower to the *omp* or *vector* dialects.
- src contains the source code (dialect, transformations, and *tinypy_opt* tool) that will be used throughout these exercises. If you are participating in one of our organised tutorials then this will all be preinstalled for you to use.

https://github.com/xdslproject/training-intro/tree/main/practical

First step….

- Logging into ARCHER2
  - Each of you has a guest account, the presenters will hand these out to you now
  - You will need to SSH into login.archer2.ac.uk from your laptop
- Details at
  - https://github.com/xdslproject/training-intro/blob/main/practical/general/ARCHER2.md
- Practical one at
  - https://github.com/xdslproject/training-intro/tree/main/practical/one