Generating Exo schedules for Gemmini kernels

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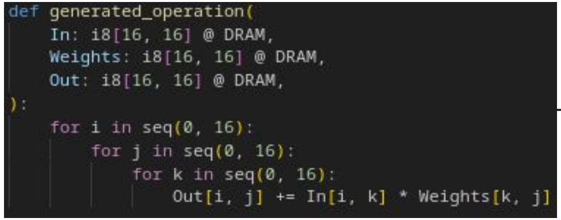
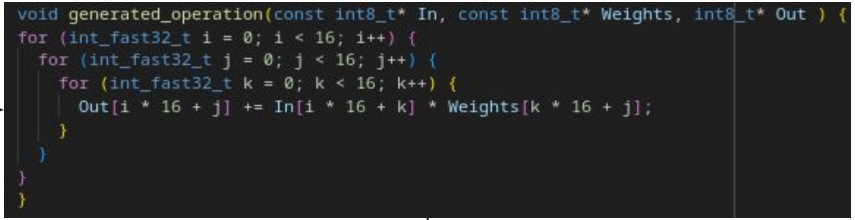
Checkpoint 1 (4/12)

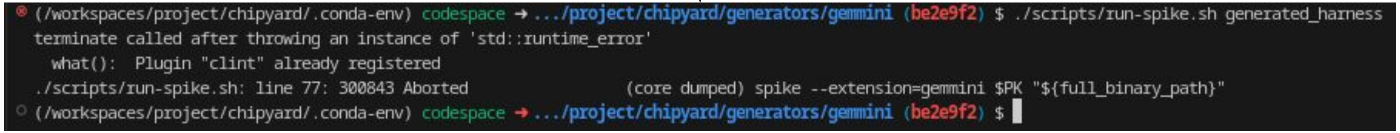
- I have brought together all the repos and read a whole lot of documentation
- The instructional machines do not have enough disk space to install the conda dependencies (I wasn't able to recreate the magic done for the labs)
    - So I've build a development container to work in locally (this took an embarrassing amount of time)
- I am trying to push Exo-generated C into a gemmini-rocc-test to get spike to run it
    - But I'm running into strange issues with spike (no clue how to proceed other than start combing through spike source)



```
def generated_operation(
    In: i8[16, 16] @ DRAM,
    Weights: i8[16, 16] @ DRAM,
    Out: i8[16, 16] @ DRAM,
):
    for i in seq(0, 16):
        for j in seq(0, 16):
            for k in seq(0, 16):
                Out[i, j] += In[i, k] * Weights[k, j]
```

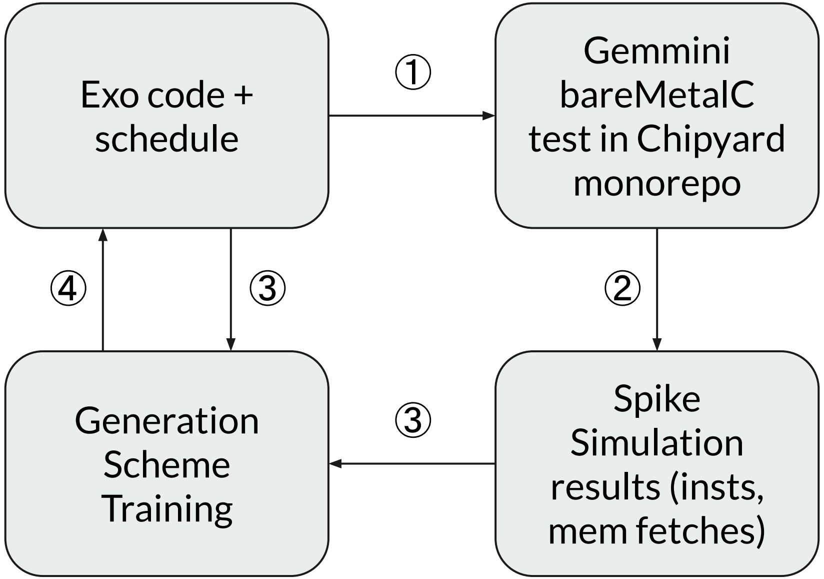


```
void generated_operation(const int8_t* In, const int8_t* Weights, int8_t* Out ) {
for (int_fast32_t i = 0; i < 16; i++) {
  for (int_fast32_t j = 0; j < 16; j++) {
    for (int_fast32_t k = 0; k < 16; k++) {
      Out[i * 16 + j] += In[i * 16 + k] * Weights[k * 16 + j];
    }
  }
}
}
```



```
⊗ (/workspaces/project/chipyard/.conda-env) codespace ➜ .../project/chipyard/generators/gemmini (be2e9f2) $ ./scripts/run-spike.sh generated_harness
  terminate called after throwing an instance of 'std::runtime_error'
    what():  Plugin "clint" already registered
  ./scripts/run-spike.sh: line 77: 300843 Aborted                 (core dumped) spike --extension=gemmini $PK "${full_binary_path}"
○ (/workspaces/project/chipyard/.conda-env) codespace ➜ .../project/chipyard/generators/gemmini (be2e9f2) $ ▌
```

Training Process from 10,000ft


Exo code + schedule
①
Gemmini bareMetalC test in Chipyard monorepo
④
③
②
Generation Scheme Training
③
Spike Simulation results (insts, mem fetches)

Checkpoint 1 summary

- Behind on consolidating environment
- Behind on generating evaluation metrics