Welcome to the gem5 bootcamp!

About the overall structure of the bootcamp

These slides and are available at https://gem5bootcamp.gem5.org/ for you to follow along.

(Note: They will be archived at https://gem5bootcamp.github.io/2024)

The source for the slides, and what you'll be using throughout the bootcamp can be found on github at https://github.com/gem5bootcamp/2024

> Note: Don't clone that repo, yet. We'll do that in a bit.

A bit about us

We are the Davis Computer Architecture Research (DArchR) Group.

https://arch.cs.ucdavis.edu

The bootcamp team

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Plan for the week

Day 1

Introduction
- Background on simulation
- Getting started with gem5
- Background on Python and gem5

Using gem5
- gem5's standard library
- gem5 resources

Day 2

Using gem5
- Running things in gem5
- Modeling cores in gem5
- Modeling caches in gem5
- Modeling memory in gem5
- Full system simulation

Day 3

Using gem5
- Accelerating simulation
- Sampled simulation with gem5
- Multisim
- Power modeling

Developing gem5 models
- SimObject intro
- Debugging and debug flags
- Event-driven simulation
- Ports and memory-based SimObjects

Day 4

Developing gem5 models
- Modeling Cores
- Modeling cache coherence with Ruby and SLICC
- Modeling the on-chip network with Garnet
- Extending gem5

GPU modeling

Day 5

Other simulators
- SST
- DRAMSim/DRAMSys
- SystemC

Contributing to gem5
- gem5 contributing process
- gem5 testing

Other things to try to fit in
- KConfig

Our goals for the gem5 bootcamp

- Make gem5 less painful and flatten the learning curve
- Give you a vocabulary for asking questions
- Provide a reference for the future
- Give you material to take back and teach your colleagues

Other likely outcomes

- You will be overwhelmed by the amount of information and how large gem5 is
  - That's OK! You can take these materials with you and refer back to them
- You will not understand everything
  - That's OK! You can ask questions as we go

How this is going to work

- We'll be going mostly top-down
  - First: How to use gem5
  - Second: How to each model can be used
  - Third: How to develop your own models and modify existing models
- Highly iterative:
  - You'll see the same thing over and over
  - Each time it will be one level deeper
- Lots of coding examples
  - Both live coding and practice problems

Coding examples

```
print("Hello, world!")
print("You'll be seeing a lot of Python code")
print("The slides will be a reference, but we'll be doing a lot of live coding!")
```

```
Hello, world!
You'll be seeing a lot of Python code
The slides will be a reference, but we'll be doing a lot of live coding!
```

Bootcamp logistics

We'll be here from 9am - 4pm each day.

Lunch will be ~12-1pm.

We'll have a breaks in the morning and afternoon.

Afternoons will have coffee/snacks.

Other admin things

Important resources

Bootcamp links

- Bootcamp website (Maybe you're here now)
  - Bootcamp archive (If you're coming to this later)
- Source for bootcamp materials (You'll work here)
- GitHub Classroom (Needed to use codespaces)

gem5 links

- gem5 code
- gem5 website
- gem5 YouTube
- gem5 Slack (for asking offline questions)