ECE 485/585

Project Description

Winter 2018

Portland State University

Basics

- **Objective**
  - Develop a simulator which models a single level of cache
- **Programming Language**
  - Any high-level programming language (C, C++, JAVA etc.)
- **Simulator Inputs**
  - Address trace provided by the instructor
  - Cache parameters (cache line size, number of sets, associativity)
- **Simulator Output**
  - Cache statistics (hit ratio, read traffic, write traffic) etc.

Simulator Components

- **Trace Reader**
  - Reads the input trace and passes the address and access type information to the cache model
- **Cache Model**
  - Models the workings of the cache
    - Does the access hit in the cache?
    - If it is a miss, does a block need to be evicted from the cache?
    - If an eviction is needed, which block should be evicted?
  - Need to keep track of each way in each set (valid, dirty, tag)
- **Output Generator**
  - Keeps track of all the relevant cache statistics (hits, misses, writebacks etc.)
  - Once the simulation has completed, print the statistics

Logistics and Timeline

- You should form groups of 2 students
- Your simulator implementation should follow the detailed project specs posted on the course website
- At the beginning of week 9 of classes, the final evaluation traces will be uploaded to the course website
- At the completion of the project, you will need to turn in a project report, which should include all the simulation results
- There will also be a short (~ 10 minutes per group) Q&A session, which must be attended by all group members
- Important Dates
  - Group names due to be sent to instructor: Wednesday, February 21
  - Q&A session: Wednesday, March 14 (automatic 1-week extension if needed)
  - Final project report due: Friday, March 23