Compiler Design Homework 8
Due Week 11

Spreadsheet

- **No new Spreadsheet homework**
- **Reminder Add and Call JIT Due Week 9**

Reminder Optimizer Research (Due Week 9)

- **Due W9** produce a short research paper for each selected optimization. Your paper will be shared with everyone in the class. So make it presentable.
- You must include:
  - **The title of the optimization**
  - **The full description of the title of the optimization**
  - **The optimization's pass category**
  - **An explanation of the optimization**
  - **Your before and after code demonstrating the optimization**
  - **Any diagrams that demonstrate the optimization**
  - **A list of any Analysis Passes that must be run and available before the pass**
  - **A list of the Analysis Passes that are invalidated**
  - **A list of the Analysis Passes that are preserved**
  - **A list of the references that you used**
- Submit a final **draft** of your paper as a **.doc** (**not .docx**) or a **PDF** to **Blackboard** before the **Week 9** class.

(New) Compiler Project (Due Week 11)

- Select four or five optimization passes that will usually improve the Cminus code produced by your compiler. Add the optimizations and their analyses to your Compiler Project by Week 11.
- Write an input file that can demonstrate that the optimizations are working. Produce two .ll files of **one before** and **one after** that span all the optimizations.
- Turn in a **readme**, your **code**, your **input** example and the **before.ll** and **after.ll** files in a **zip** to **Blackboard** by **Week 11**.

Reading

- Read "***LLVM Programmer's Manual***" starting at section "*The Core LLVM Class Hierarchy Reference*" to the end.
- https://llvm.org/docs/ProgrammersManual.html#the-core-llvm-class-hierarchy-reference

- Scan through "***LLVM for Grad Students***" by Adrian Simpson at
- http://www.cs.cornell.edu/~asampson/blog/llvm.html . This has a reference to a helpful skeleton llvm pass on github. It also describes the dump() capability.

- Read **the first five sections** of **"*Writing an LLVM Pass*"** in http://releases.llvm.org/13.0.0/docs/WritingAnLLVMPass.html. Skip the **"Pass classes and requirements"** down through **"The MachineFunctionPass class"** section**,** and **r**ead **"Pass registration"** through **"The releaseMemory method."** before **the Week 9 class**

- **Listen to How to Speak** but understand that because your presentation is meant to be informative, text is helpful.