HW2 Deadline Extends & HW 3

CSIE 5054: Advanced Compiler Design
Instructor: Shih-Wei Liao

Homework 3: Translating Bril SSA to LLVM IR

- **Deadline: 2024/12/01 23:59**
- **Homework 3 Specification**
  - **The deadline in HW3 Spec should be 12/01 instead of 11/29**
- **Homework 3 Github Repo**

Homework 3: Translating Bril SSA to LLVM IR

- **Goal: convert a BRIL program in SSA form to LLVM IR**
- **Set up environment**
  - Bril toolchain (HW0)
  - Python3.7+
  - LLVM 17.0.0+
- **Implementation Tasks**
  - copy files from HW2 to /src
  - LLVM IR Generation (ssa_to_llvm.py)
- **Validation**

```
homework-directory/
├── src/
│   ├── driver.py
│   ├── bril.py
│   ├── cfg.py
│   ├── dominance.py
│   ├── ssa_construct.py
│   ├── ssa_to_llvm.py
│   └── [other source files]
├── tests/
│   ├── loop.bril
│   └── [additional test cases]
├── bril/
├── install_bril.sh
├── run_test_case.sh
├── student_id.txt
└── README.md
```

Homework 2: SSA Construction for Bril

- **Deadline Extended: 2024/11/15 23:59**
- Homework 2 Specification
- Homework 2 Github Repo

Installation Guideline

- Make sure LLVM is installed properly (see link)

```
- name: Install LLVM and Clang
  run: |
    wget https://apt.llvm.org/llvm.sh
    chmod +x llvm.sh
    sudo ./llvm.sh 17
    sudo apt-get install -y llvm-17 llvm-17-dev llvm-17-runtime clang-17
    sudo update-alternatives --install /usr/bin/llvm-config llvm-config /usr/bin/llvm-config-17 100
    sudo update-alternatives --install /usr/bin/lli lli /usr/bin/lli-17 100
    sudo update-alternatives --install /usr/bin/clang clang /usr/bin/clang-17 100
```

Implementation Guideline

- There are bunch of conditions to translate BRIL program. However, besides these conditions, there are some details worth to notice.
- For examples
  - What are the differences between the instruction types in LLVM and BRIL?
  - How does the main function take input arguments in LLVM compared with BRIL?
  - How do other functions take input arguments, and what are their types?
  - What should functions return?
  - How to print?
- Even if all above details are considered carefully, there may be some bugs in your ssa construction not tested out, which should be fixed.
- Hope these help you debug !

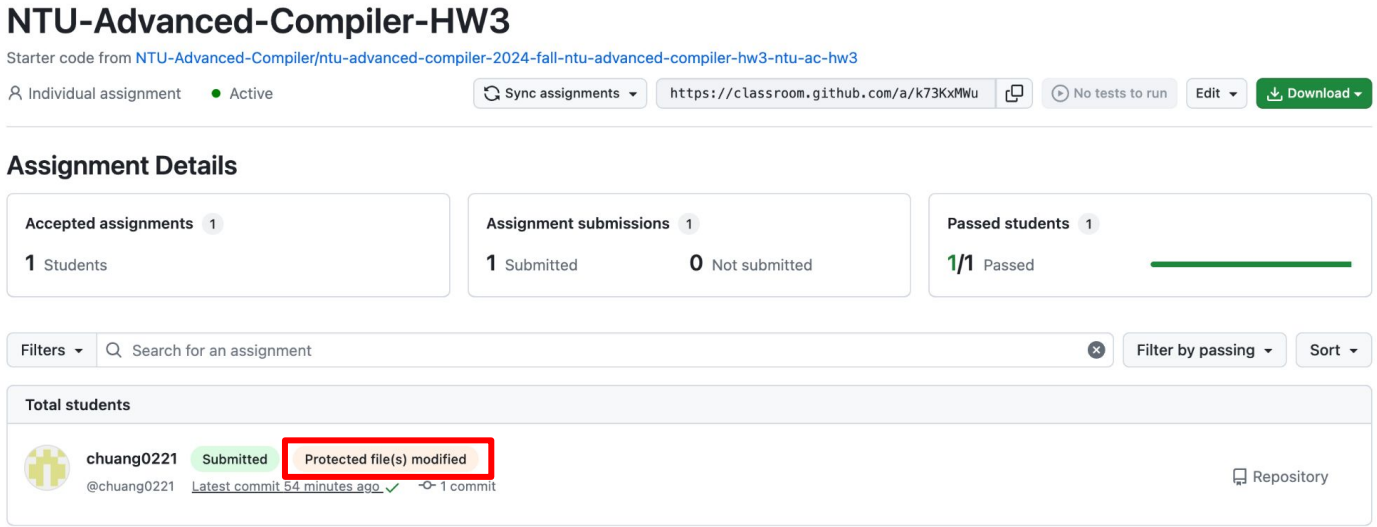
DOs and DONTs

- Consult LLVM manual before asking questions
- Ensure your Student_ID are correctly entered in student_id.txt
- Within /src directory
  - Feel free to modify any files
- Do NOT modify anything except for the above-mentioned files. Any such changes will be considered cheating.

```
homework-directory/
├── src/
│   ├── driver.py
│   ├── bril.py
│   ├── cfg.py
│   ├── dominance.py
│   ├── ssa_construct.py
│   ├── ssa_to_llvm.py
│   └── [other source files]
├── tests/
│   ├── loop.bril
│   └── [additional test cases]
├── bril/
├── install_bril.sh
├── run_test_case.sh
├── student_id.txt
└── README.md
```

DOs and DONTs

- **Please note that we will be able to see through the GitHub Classroom backend if you have made changes to files that should not be modified.**



DOs and DONTs

- **Plagiarism is NOT allowed**
- **TAs will NOT provide debugging support for coding**
- **If you have any questions relating to the homework, please email to llvm@csie.ntu.edu.tw with the subject line '[AC-HW3][Summary of Your Issue]'**

Reference

1. llvm.org
2. Getting Started with LLVM Core Library
3. A Gentle Introduction to LLVM IR