



Homework H9

1 Description

Write an LLVM pass starting from the code you have developed for H8.

The goal of this assignment is to improve the compilation time of your H8. This assignment may require to improve your work if your H8 did not propagate enough CAT constants.

2 Testing your work

H9.tar.bz2 includes a set of tests and a C program. The tests are included in H9/tests/correctness and your pass needs to pass them all. To check it, go to H9/tests/correctness and run `make`.

If your H9 passed all tests, then you can measure its performance. To do so, go to H9/tests/performance/test0 and run `make`. The output includes the compilation time and the total number of invocations of CAT functions that are executed at run time. Your pass will be evaluated on `hanlon`.

You can obtain up to 20 points for this homework.

- To obtain the first 5 points: your compilation time needs to be ≤ 7 seconds with ≤ 445 invocations.
- To obtain 5 more points: your H9 needs to have a compilation time ≤ 13 seconds with ≤ 235 invocations.
- To obtain 5 more points: your H9 needs to have a compilation time ≤ 16 seconds with ≤ 192 invocations.
- To obtain the last 5 points: your H9 needs to have a compilation time ≤ 5 seconds with ≤ 132 invocations.

3 Rules for H9 and the competition

Operations of CAT variables (e.g., add, set) have to be either performed at compile time by your pass via constant folding or they have to be performed via the CAT APIs.

4 What to submit

Submit via Canvas the C++ file you've implemented for H9 (CatPass.cpp).

For your information: my solution for H9 added 63 lines of C++ code to my H8 (computed by `sloccount`).

Good luck with your work!