Google

PDLL

Frontend Pattern Language

River Riddle

Background: PDL, Pattern Descriptor Language

This presentation assumes some background on PDL:

- 2021-04-15: Pattern Descriptor Language ; slides - recording
- 2019-12-19: Interpreted Pattern Match Execution ; slides - recording

Introduction

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- Designed as a high-level representation of MLIR and PatternRewriter constructs
  - Support for all MLIR constructs; Optional, Variadic, Region, Successor, etc.
- Built with modern language tooling in mind
  - Code completion, go-to-definition, formatting, etc.

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```
// Suppose we have a three result operation, defined as seen below.
def ThreeResultOp : Op<"three_result_op"> {
    let arguments = (ins ...);

    let results = (outs
      AnyTensor:$output1,
      AnyTensor:$output2,
      AnyTensor:$output3
    );
}

// To bind the results of `ThreeResultOp` in a TDRR pattern, we bind all results
// to a single name and use a special naming convention: `__N`, where `N` is the
// N-th result.
def : Pattern<(ThreeResultOp:$results ...),
              [(... $results__0), ..., (... $results__2), ...]>;
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```
Pattern {
  // In PDLL, we can directly reference the results of an operation variable.
  let threeResultOp = op<my_dialect.three_result_op>;
  let userOp = op<my_dialect.user_op>(threeResultOp.output1, threeResultOp.output3);
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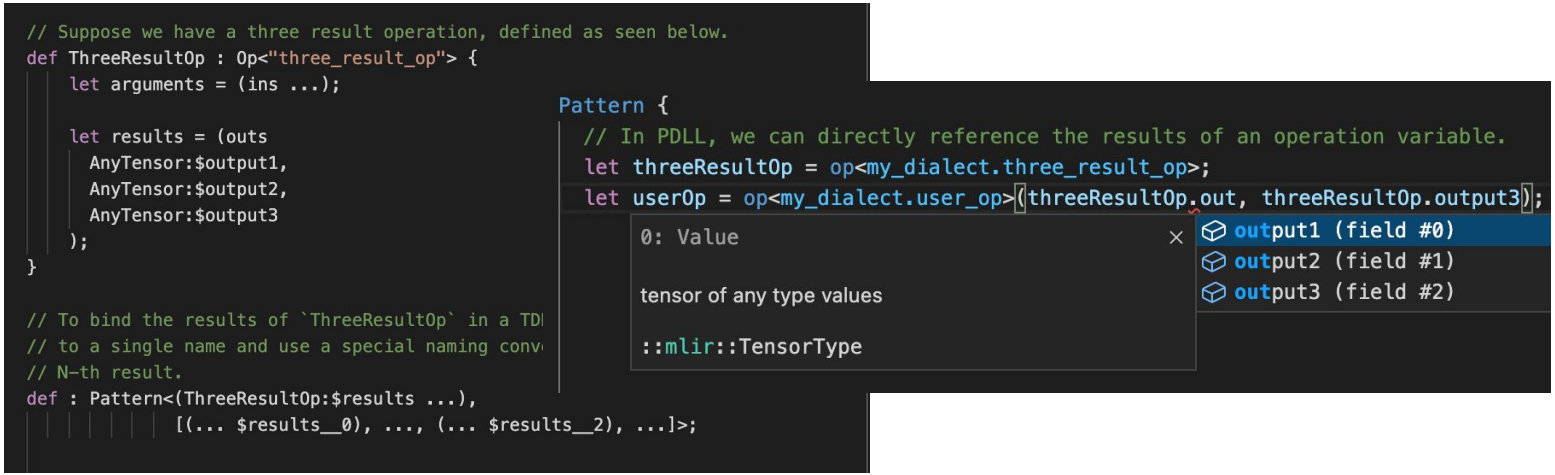

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  - Yes
    - PDL (the underlying infra) was designed with multiple frontends in mind
    - Different users have different constraints

Language Demo

Status

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  - Everything in the demo
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  - Performance improvements and optimizations for PDL

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  - Performance improvements and optimizations for PDL
  - Formalize RFC and develop upstream

Thanks