1 Introduction

Your first assignment is to extend an existing implementation of a front end for Flang. The front end consists of a scanner, parser, and type checker, and you will have to make modifications to all three of these phases.

2 Extensions

This section summarizes the extensions that you are responsible for implementing. You should refer to the supporting documentation about Flang for the details of the syntax and typing rules for these extensions.

- extend the implementation to support mutually recursive datatypes
- extend the implementation to support mutually recursive functions
- extend the implementation to support the or-else (| |) and and-also (&&) conditional operators
- extend the implementation to support the try-catch and throw expression forms.

3 Modifications

You will be provided with an implementation of a front-end for the version of Flang used in CMSC 22610 last quarter (the provided code is essentially a solution to Project 3). To implement these extensions, you will have to modify the following components of the provided code:

- modify the lexer to recognize new tokens (parser/flang.lex)
- modify the parse-tree representation to represent the new syntactic forms (parser/parse-tree.sml)
- modify the parser to recognize new syntactic forms and to build the corresponding parse-tree representation (parser/flang.grm)
- modify the parse-tree printer to print the new parse-tree representations (parser/print-parse-tree.sml)
• modify the type checker to handle the new constructs (typechecker/typechecker.sml)

The seed code will include modifications to the AST representation of programs (typechecker/ast.sml and typechecker/print-ast.sml).

4 Submission

This project is due at 10pm on Wednesday, April 15. You should submit your code by committing it to your phoenixforge svn repository. Please put your code into a directory called “proj-1.”

Note: It is important that your code compile. Code that does not compile (i.e., has syntax or type errors) will get 0 points for correctness.

5 Document history

April 1, 2015 Original version.