CS225 Spring 2018—Final Project Proposal

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https://github.com/ysu3/cs225Final.git

Project: Exceptions—TAPL Chapter 14

This project is to make functions which throw exceptions and functions which catch exceptions.

Base Language

We will work with simply typed lambda-calculus with booleans, natural numbers, let-binding, and products as the base language.

Extended Language

The extended language includes the 3 new types:

1. New syntax, t :: = … error

2. New syntactic forms, t ::= … try t with t

3. New evaluation rules as follows:

    a. error t2 $\rightarrow$ error (E-AppErr1)   (used for raising exceptions)

    b. v1 error $\rightarrow$ error (E-AppErr2)   (used for raising exceptions)

    c. try v1 with t2 $\rightarrow$ v1(E-TryV)   (used for handling exceptions)

    d. try error with t2 $\rightarrow$ t2(E-TryError) (used for handling exceptions)

4. new typing rules, $\Gamma \vdash error : T$

Description

Two new evaluation rules mean as following:

If we evaluate an application, the left-hand side is an error and right-hand side is a value, then raise an error.

Alike, when we evaluate an application with right-hand side is an error and left-hand side is a value also evaluates to error as well.

Project Goals for this project, we expect that we could finish the following things:

1. check if the left-hand side is an error when the right-hand side is a value then raise result.
2. Check the right-hand side and determine if it is an error when the left-hand side is a value, then decides if raising the exceptions.
3. After raised an exception, the application could handle the exception.

Expected challenges

we excepted that there would be some code we have to familiar with first, because LaTex is a new area for us. Also, there would be lot of reference needs to be used.

Timeline and Milestones By the checkpoint we hope to have completed:

1. List all situations about exceptions.

2. Throw the exceptions to handle them.

By the final project draft we hope to have completed:

1. By the final project draft we hope to have completed:

By the final project submissions we hope to have completed:

1. The final writeup for the final project.

2. Complete the presentation.