

Assignment #1

Name: _____ ID: _____

This assignment has **2** questions, for a total of **25** marks.

Question 1: **Proof Cases** 5 marks

Complete the missing proof cases for the proof of forward simulation (`true`, `let x = e in e'`, `e · e'`). Spell out the inductive hypotheses in the inductive cases.

Question 2: **Exceptions** 20 marks

Encode expressions for throwing and catching exceptions both in the source and in the target language [4] and define their semantics [6]. If this is simpler for you, you can change the whole semantics to be big-step or to SOS (this is not necessary, but it may help some people). Exceptions in the source must be typed so provide the typing rules for exception-related expressions [4]. Change the compiler so that exceptions are thrown securely in compiled programs and argue why is that compiler fully abstract [6].

Note: you may have to change things around in order to do this, it's up to you to find out what; as always strive for an elegant solution.