

Homework 7 - IMP

* If there is any problem, please contact TA.

Name:_____ Student ID:_____ Email: _____

Problem 1. (30 points) Wouldn't it be simpler just to require the programmer to annotate error with its intended type in each context where it is used? Why?

Problem 2. (35 points) In lecture *Going Imperative*, the language is extended with while loop. In this problem, you are required to define the syntax and the semantics (including evaluation rules and typing rules) of while loop with **break** and **continue**

Problem 3. (35 points) Prove **Progress Theorem**: If e is closed and well-typed (i.e. $\Sigma; \cdot \vdash e : t$ for some Σ and t), then either e is a value or for any store M such that $\Sigma; \cdot \vdash M$, there exists an expression e' and store M' , such that $(M, e) \rightarrow (M', e')$. (e is restricted to be the same as on page 6 of lecture 7, which means you don't need to consider sequence, while loop and error)

Remark: You just need to send your .pdf file to likaijian@sjtu.edu.cn. Email Subject line Format(also the pdf file name): **HW_X_Name_StudentID**