# COMPSCI 3MI3 : Assignment 6

Fall 2021

Nicholas Moore

Solutions submitted as a LaTeXgenerated pdf file are eligible for 1 bonus point, so long as the source file is included with submission.

1. **Typing Rules**
   In slide set 7, slides 9 and 13, we described typing rules for our simple language of arithmetic expressions. Propose new typing rules for the following operations. Note: you do not have to define operational semantics for these rules, but you will need to provide grammars. Typing rules should be presented in the inference-rule style.
   (a) (4 points) Logical "and"
   (b) (4 points) Arithmetic addition

2. (4 points) **Well-Typedness of Subterms** Prove that every subterm of a well-typed term is also well-typed.

3. (10 points) **Preservation** In slide set 7, slides 33 - 41, we describe a proof of the preservation property of TAE. This proof is inductive over typing derivations. Reorganize the proof so that it is inductive over evaluation derivations instead.