TDT4205 Problem Set 4
Spring 2016

Answers are to be submitted through *It's Learning*, by Mar. 29^{th}, 20:00. **This problem set is graded, and counts for a total of 10% of the final mark**

1 Theory

1.1 15%

Briefly explain the difference between L-attributed and S-attributed Syntax-Directed Definitions.

1.2 10%

Given the inference rules

$$\frac{E1{:}T\, E2{:}T}{E1{>}E2{:}bool}$$

$$\frac{C{:}bool\, E1{:}T\, E2{:}T}{(C)?E1;E2{:}T}$$

and the premises that 2:int and 3.14:float, show a proof tree with judgements on the types of x and y in the statement
$(x > 2)?y; 3.14$

2 Programming

Given the provided program archive ps4_skeleton.tgz,

2.1 15%

Implement the function find_globals in ir.c, to populate the global symbol table with

1. Global variables (5%)
2. Functions (10%)

2.2 45%

Implement the function bind_names in ir.c, to populate local symbol tables with

1. Parameters (15%)
2. Local variables (15%)

and link the entry pointers in its syntax tree nodes to their appropriate symbols. (15%)

2.3 10%

Extend bind_names to create a global table of strings.

2.4 5%

Implement the function destroy_symtab, to remove dynamically allocated symbol table data at the end of compilation.

Details on the function of these implementations are given in the accompanying recitation slide set.