CS 280
Fall 2022
Recitation Assignment 8
November 17, 2022

Due Date: Monday, November 21, 2022, 23:59
Total Points: 5

In this recitation assignment, you are given the definition of a Class, called *Value*, which represents values of operands in the language to implement its interpreter in Programming Assignment 3. These include values for the three defined types in the language: INT, FLOAT, and BOOL, as well as the string literal. The objective of defining the *Value* class is to facilitate constructing an interpreter for the language which evaluates expressions and executes statements using C++.
In RA 8, you are required to implement some of the overloaded operators of the *Value* class in order to enable testing this class separately as a unit before using it in the construction of the interpreter in PA3. You are required to implement the overloaded operators for Subtraction, Multiplication, Less-Than, and AND operations. The semantic rules governing the evaluation of expressions in the language are summarized below:

- The binary operations for addition, subtraction, multiplication, and division are performed upon two numeric operands (i.e., INT, FLOAT) of the same or different types. If the operands are of the same type, the type of the result is the same type as the operator's operands. Otherwise, the type of the result is FLOAT.
- The binary logic operations for the AND and OR operators are applied on two Boolean operands only.
- The LTHAN and GTHAN relational operators and the EQUAL operator operate upon two operands of compatible types. The evaluation of a relational expression, based on LTHAN or GTHAN operators, or an Equality expression, based on the Equal operator, produce either a true or false value.
- The unary sign operators (+ or -) are applied upon one numeric operand (i.e., INT, FLOAT). While the unary NOT operator is applied upon a one Boolean operand (i.e., BOOL).

Note: It is recommended to implement the other overloaded operators in the Value class and testing them before using the class implementation in the PA 3 interpreter project.

Vocareum Automatic Grading

- A driver program, called "ra8prog.cpp", is provided for testing the implementation on Vocareum. The "ra8prog.cpp" will be propagated to your Work directory, along with the definition of the *Value* class in the "val.h" file.
- You are provided by 4 test case files associated with Recitation Assignment 8. Each test case checks the implementation of one of the overloaded operator functions. Vocareum automatic grading will be based on the produced output of your implementations for the required overloaded operators compared with the test case file. You may use them to check

and test your implementation. These are available in a compressed archive "RA 8 Test Cases.zip" on Canvas assignment.
- "ra8prog.cpp" is available with the other assignment material on Canvas.

Submission Guidelines

- Please upload your implementation to Vocareum as a "val.cpp" file. The file should include the implementations of the Value overloaded operators functions for Subtraction, Multiplication, Less-Than, and AND operators.

- **Submissions after the due date are accepted with a fixed penalty of 25%. No submission is accepted after Wednesday 11:59 pm, November 23, 2022.**

Grading Table

Item	Points
Compiles Successfully	1
Test case 1: Subtraction overloaded operator	1
Test case 2: Multiplication overloaded operator	1
Test case 3: Less Than overloaded operator	1
Test case 4: Logical AND overloaded operator	1
Total	5