Advanced Programming (I00032)
A DSL for Sets with Type Classes

Assignment 11

In the previous assignments we made a DSL for sets using different implementation techniques. In this assignment you make an implementation of this language with based on type constructor classes as outlined in the lecture.

1 DSL

The set-language contains basic values, sets of basic values, and simple statements. The basic values in this assignment are integers, Booleans and characters. For these types the basic operations (addition, subtraction, multiplication, negation, logical and, logical or etc.) should be defined. Use overloading whenever appropriate. The basic set operations (new, insert, delete, union, difference and intersection) should be defined. The statements are the introduction of a new variable, the assignment to a variable, and sequential composition.

Define such a DSL using overloading whenever possible.

2 Show View

Define a view of the DSL that gives a representation of the program in the DSL as `[String]`.

3 Evaluation View

Define an evaluator for expressions in this DSL. The evaluator should show the final result of evaluation as well as the final value od all variables used.

4 Bonus: Double Views

This part is somewhat tricky, make it whenever you like an additional challenge. Define a function that gets a term in the DSL as arguments and shows this term as well as evaluates it.

Hint: to bypass the monomorphism restriction you have to implement a new view that contains both views needed as parts. This requires a tuple like view that can be used as instance of the DSL.

Deadline

The deadline for this assignment is December 6, 13:30h.