Assignment #6a - Static analysis datastructure
Discrete Mathematics

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The VSSL programming language

To experiment with static analysis, we will use a **V**ery **S**imple **S**tructured **L**anguage.

The key features of the language is:

- The only data types are booleans (BOOLEAN) and integers (INTEGER).

- It supports functions and procedures, but we will not use that in this example.

- It supports blocks of code, curly braces around statements ended with semicolons.

- It supports selections with the IF (...) *code block* and IF (...) *code block* ELSE code block statements

- It supports iterations with the WHILE (...) *code block* statement.

- Code blocks, selections, and iterations can be nested.

A more precise description will follow the next assignment (#6b).

The computer state

To do the static analysis we need a data structure to register the possible states of the computer after each statement of the program has been executed.

The computer state should:

- Keep track of each variable in the program and which possible values it can have in the state. In rare cases we know the exact value of a variable, but mostly, we only know a span of possible values or maybe only the fact that the variable is initialized.

- Be partially ordered.

- Support local minimum (intersection) and local maximum (union) between states (will be explained in class).

1 Create a computer state data class

Create a class that supports the features described above. The class must implement a set of known variables each being a set of possible values. Remember, that the minimum and maximum functions must operate on the variable sets as well.

Hand in

This assignment is a part of Assignment #6 and has no separate hand in