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Milestone 3

COMP 520

Presented to Prof. Laurie Hendren

McGill University

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# COMPUTATION INTENSIVE PROGRAMS

TODO

## CODE GENERATION STATUS REPORT

**Target language:** C++

By choosing C++, the code generation is quite simple. In fact, Go-lite and C++ share many constructs.

The the code generation for the following subset of Go-lite has been implemented:

- C++ header
- Variable declarations (including multiple variable declarations with matching expressions)
- Type definitions
- Types (C++ equivalent: int, double, bool, char, std::string), excluding structs, slices and arrays.
- Function declarations including signature, arguments and body
- The following statements: empty, block, return, if, if-else, for (including 3-part for loop, while loop and infinite loop), break, continue, assignment, print and println.
- No binary expressions.

## TEAM ORGANIZATION

Dan:

- Testing

Justin:

- Code generation

Serguei:

- Intensive programs

## INTENSIVE PROGRAMS

**primeNumbers.go:**

This program generates the *i*'th prime number where *i* is a number that is hardcoded in a variable. We will change this number to be able to choose the computation time that we want.

The algorithm is quite simple. For every number we check if it can be divided by the previous prime numbers that we found. We only check with prime numbers that are less or equal to the upper bound of  $\sqrt{\text{number}}$ . Since we don't have the  $\sqrt{\text{number}}$  function we just keep track of it using a variable and its square value.

#### **queenPuzzle.go:**

This is the famous queens problem where we have a chessboard of size **NxN** and we have to place **N** queens on it such that no two queens attack each other (horizontally, vertically or diagonally).

In our program this problem is solved using simple recursion. To have more control on the computation time we just set the variable **N** to the size that we want.