

CSC 526, Spring 2020, Assignment 2

Purpose: Integer arithmetic

Due: 11:59pm, Wednesday, February 12, 2020

Get the assignment code

These instructions assume that your course git repository is set up. Change into your course repository directory and enter the following commands.

```
git fetch assignments
git checkout assignments/master -- assignment2
git add assignment2
git commit -a
```

This will copy the `assignment2` directory into your working directory, start tracking the files in the `assignment2` directory, and commit those files to your local git repository.

Assignment Description

The purpose of this assignment is to implement code generation for a simple arithmetic language. The syntax of the language uses a parenthesized prefix notation for operations. This is similar to the Lisp family of languages. One benefit of this representation that it is a simple textual representation of an Abstract Syntax Tree.

Syntax

```
<program> :=
  | (<expr>)

<expr> :=
  | <integer>
  | (add1 <expr>)
  | (sub1 <expr>)
  | (+ <expr> <expr>)
  | (- <expr> <expr>)
  | (* <expr> <expr>)
```

Assembly instructions

The assembly instructions that you need for this assignment are:

- `movq <src> <dest>` – copies the left operand (source) into the right operand (destination). The source can be an immediate argument, a register, or a memory location. The destination can be a register or a memory location.
- `addq <src> <dest>` – $\langle \text{dest} \rangle = \langle \text{dest} \rangle + \langle \text{src} \rangle$
- `subq <src> <dest>` – $\langle \text{dest} \rangle = \langle \text{dest} \rangle - \langle \text{src} \rangle$

- `imulq <src> <dest> - <dest> = <dest> * <src>`

Turning in the Assignment

To turn in the assignment execute the following git commands from within your repository:

```
git commit -a
git push origin master
```

Grading Criteria

The program will be graded by executing the `compile.sh` script and running the executable. Your program can assume that all input files are well-formed, that is, your program does not need to perform lexical or syntactic error checking.