

210: Compiler Design

Spring 2018

Homework 0

Due: March 1, 2018, 10 a.m.

0 Points

Introduction

The homework for this class will require you to construct a simple compiler for a simple object-oriented language. The task of this homework is to familiarize yourself with assembly language.

The compiler's target platform is the IA32 architecture or, more specifically, the IA32 instruction set in the dialect of the [GNU Assembler](#).

In the framework used in this class we officially support only Linux, as this is the operating system we will use for grading. However, you should be able to use the framework on macOS or Windows and you are welcome to do so as well. For Windows, we recommend that you use the [Cygwin](#) assembler.

Task 1: Registration

You will work in a team of two students. Find a team member and register here:

<http://creek.inf.ethz.ch:8080/microteams-cd.html> until *February 28, at 23:59*. We will use this information to set up the SVN repositories for your team.

In case you are unable to find a team member, please contact one of the course assistants, who will match you up with somebody.

Task 2: Simple Assembly Program

To develop the compiler, you have to be familiar with assembly language. Some programs will contain input and output statements, so you should also understand how to read and write integer values from and to standard input/output. It is perfectly acceptable to use existing libraries (e.g. `libc`) – one of our goals is to explore software reuse, and you are encouraged to build on existing OS services of your target platform.

To demonstrate that you have a basic understanding of the IA32 instruction set, write a simple assembly program that reads an integer from standard input, adds one to it, and prints the output to standard output.

To get started, you may write a simple C program and compile it into assembly language using the following command, which will produce a `program.s` file in the target language:

```
gcc -S -m32 program.c
```

To assemble and execute your program, use the following commands:

```
gcc -m32 -o program program.s
./program
```

Note that some Linux distributions do not include 32-bit libraries by default. For Debian-like distributions, install the `gcc-multilib` package to get them.

Hand-in

The solutions to all homework tasks are to be submitted via your team's SVN repository, which we will set up after the team registration deadline. The URL for your repository is:

```
https://svn.inf.ethz.ch/svn/trg/cd_students/ss18/teams/<YourTeam>
```

As you can see, this assignment carries no points and will not be graded. Still, we ask you to check in your solution under a folder called **HWO** (all upper case), which you will have to create first.