

Computer Science and Engineering
IIIT Kalyani, West Bengal

Compilers Design Laboratory (Spring: 2017 - 2018)

3rd Year CSE: 6th Semester

Assignment - 2

Marks: 10 + 5

Assignment Out: 12th January, 2018 Report on or before: 19th January, 2018

1. Write a C++ program that will take one or two command line arguments. The first argument is the name of a relocatable C++ file (ELF) containing a set of simple functions of type `int xyz(int)`¹. The second argument is an internal name of one of the functions². The C++ program *opens* and *maps* the relocatable file in its logical address space. It also reads an integer *n*. Finally it does the following:
 - If there is one command line argument i.e. the relocatable file name is specified, but no function name is given, the first function from the beginning of `.text` of the relocatable file is invoked using inline assembly language code of x86-64 from the C++ program. The integer *n* is passed as the parameter of the call.
 - If there are two command line arguments i.e. the name of the relocatable file (the first argument) and the internal function name (second argument) within it are passed, the function is invoked using *n* as the argument.
 - In both the cases the C++ program prints the value returned by the called function.

It will be necessary to navigate through the ELF data structure of the relocatable file to locate the beginning of the `.text` section and/or the specified function. Definitions of ELF data structures are available in `elf.h`. Reading material for ELF is available at

<http://cse.iitkgp.ac.in/~goutam/compiler/readingMaterial/index.html>

¹Functions are not calling any other function.

²Note that the C++ compiler may modify the actual name of the function.