VG101 — Intoduction to Computers & Programming

Lab 3

Instructor: Manuel Charlemagne

TA: Yihao Liu – UM-JI (Summer 2018)

Goals of the lab

- Install C/C++ Compiler
- Install C/C++ IDE
- Usage of JOJ Online Judge

1 Introduction

Krystor and Frank are now researching on some more difficult mathematical problems, which need a large number of calculations. They found that MATLAB is too slow for such calculations, so they moved on to C, which is probably to most efficient language in the world.

Now they find some difficulties in compiling a simple C program, and they are using notepad to write the code, which is not user-friendly for programming. They think you have setup the C programming environment, so they ask you for some help.

2 Working Flow

Krystor works on Mac OS and Frank works Windows, so they may receive help from different of you. Fortunately, you preserved the manual of setup provided by Simon, so you are able to complete the tasks easily.

2.1 Install C/C++ Compiler

2.1.1 Windows

You can select either of two approaches, while the first one is much easier, and the second one will give you some first experience in command line interface (cli).

Approach 1

Download and install mingw-w64 from `https://sourceforge.net/projects/mingw-w64/files/latest/download`. Use the config shown in Figure 1.

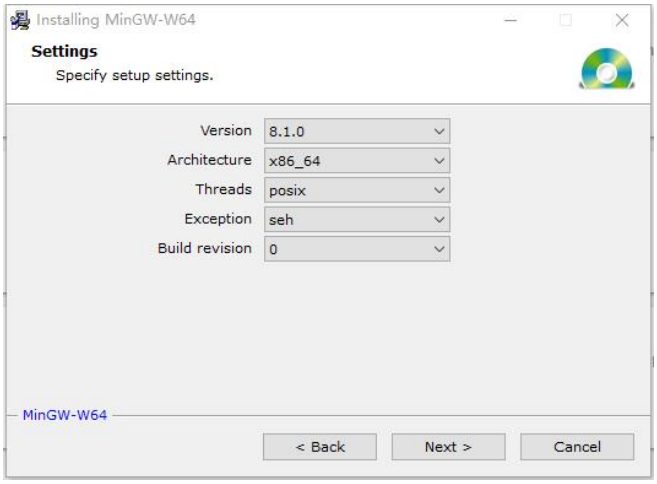

Figure 1: Install config of mingw-w64

Approach 2 (advanced)

Chocolatey is the package manager for Windows.

You can install the msys2 environment with chocolatey, and install mingw in msys2.

1. Open the Windows Powershell (or cmd for Windows 7) with administration user.
2. Run the install script from Chocolatey.
3. Reopen the Windows Powershell (or cmd) with administration user.
4. Run `choco install -y msys2`
5. Close the shell and open `msys2`
6. Run these scripts to change to the ustc mirror (optional, but faster in China).

```
sed '1i Server = http://mirrors.ustc.edu.cn/msys2/mingw/i686'
↪ /etc/pacman.d/mirrorlist.mingw32
sed '1i Server = http://mirrors.ustc.edu.cn/msys2/mingw/x86_64'
↪ /etc/pacman.d/mirrorlist.mingw64
sed '1i Server = http://mirrors.ustc.edu.cn/msys2/msys/$arch'
↪ /etc/pacman.d/mirrorlist.msys
pacman -Sy
```

7. Install the mingw toolchain in msys2

```
pacman -S mingw-w64-x86_64-toolchain libraries development compression VCS
↪ sys-utils net-utils msys2-devel mingw-w64-x86_64-cmake
```

You may check https://www.jianshu.com/p/c740b71e7775 for reference.

2.1.2 Mac OS

Mac OS will alert you when you enter a command in the terminal that requires Xcode Command Line Tools. For example, you can enter `gcc` or `make`. If you haven't the tools installed, you will see something like Figure 2.

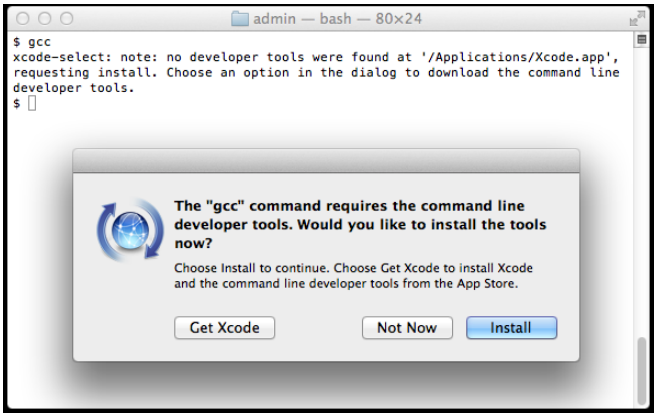

Figure 2: Xcode Command Line Tools

Click "Install" to download and install Xcode Command Line Tools.

The instructions in the alert box are confusing. You don't need to "Get Xcode" from the App Store. Just click "Install" for the Xcode Command Line Tools. If you have a slow Internet connection, it may take many minutes.

After the tools are installed, if you enter `gcc` again, you can something like get (the version may be slightly different since new versions are kept being released)

```
$ gcc --version
Configured with: --prefix=/Library/Developer/CommandLineTools/usr
  ↪  --with-gxx-include-dir=/usr/include/c++/4.2.1
Apple LLVM version 6.0 (clang-600.0.54) (based on LLVM 3.5svn)
Target: x86_64-apple-darwin14.0.0
Thread model: posix
```

2.1.3 Linux

`gcc` is installed by default on most of the Linux distributions, so you don't need to do anything!

2.2 Install C/C++ IDE (Integrated Development Environment)

Note

You can choose any IDE you prefer, but we recommend Clion in this course. We may only provide support for the configuration of Clion and Atom.

2.2.1 Clion

Clion is a a cross-platform IDE for C and C++. It is not a free software, but it's free for educational use. You can use your sjtu email to apply for a free license.

1. Create a Jetbrains Account with your sjtu email at https://account.jetbrains.com/login.
2. Receive an email in your sjtu mailbox and open the confirm url, and create a password.
3. Login with your new account, apply for your student license at https://www.jetbrains.com/shop/eform/students.
4. Confirm again in your sjtu mailbox.
5. Remember to confirm the license agreement on the website.

Then you can download the Jetbrains Toolbox App from https://www.jetbrains.com/toolbox/app/ and install Clion in that after you login. It can automatically upgrade your Jetbrains software.

You can also download Clion directly from https://www.jetbrains.com/clion/, but you may need to activate it yourself, and it can't be automatically upgraded, so not recommended.

Clion will ask you to configure the mingw home (only Windows) in your fresh installation, then you should choose where you installed your mingw.

2.2.2 Atom

Atom is a hackable text editor for the 21st Century, you can download and install it from https://atom.io/.

You will find some packages like `linter-gcc` useful.

2.2.3 Sublime Text

https://www.sublimetext.com/

2.2.4 Visual Studio Code

https://code.visualstudio.com/

2.3 Test on JOJ Online Judge

Frank and Krystor want to learn some C programming skills, and they find an Online Judge System called JOJ useful. The url is https://joj.sstia.tech.

There are two very simple problems on it to test their very basic programming skills on C. They've completed it successfully, so they are inviting you to join them.

The inviting link is https://joj.sstia.tech/d/vg101_summer_2018_manuel/join and the invitation code is `ilovevg101`.

Try to complete the two problems on https://joj.sstia.tech/d/vg101_summer_2018_manuel/homework/5b1a308fcd71a7f667723a87.

You must save all your files into a .tar archive without any sub folder before submitting. We recommend you to use `7-zip` on Windows, or `betterzip` on Mac OS.

You can also use the command `tar` in the command line. If you have two files `main.c` and `l3.c` to submit, run the command in that directory:

```
tar -cvf submit.tar main.c l3.c
```

And then you can submit the file `submit.tar` on the OJ.

The description of problems on OJ are listed below:

2.3.1 Hello World

Input: nothing
Output: A string "Hello, World!"

2.3.2 A + B Problem

Input: Two integers x and y, satisfying $0 \leqslant x, y \leqslant 32767$
Output: One integer, the sum of x and y.