FRENDY installation

Japan Atomic Energy Agency (JAEA)
Kenichi TADA

tada.kenichi@jaea.go.jp
Contents

• Installation Ubuntu (Ubuntsu 20.04.1 LTS) on Windows Subsystem for Linux (WSL)

• Construction of development environment on Ubunt
  • Installation of development tools, e.g., gcc
  • Compilation of FRENODY
Introduction of Windows Subsystem for Linux (WSL)
Activation of WSL (1/4)

• Right click the Windows icon.
• Launch up “Apps and Features”.
Activation of WSL (2/4)

- Click “Program and Features” on Related settings.

- Click “Turn Windows features on or off”.

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Settings

Home

Find a setting

Apps & features

Choose where to get apps

Installing apps only from Windows Store helps protect your device.

Anywhere

Apps & features

Related settings

Programs and Features

Have a question?

Changing startup apps
Troubleshooting Microsoft Store apps

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Control Panel\Programs\Programs and Features

View installed updates

Turn Windows features on or off

Uninstall or change a program

To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Activation of WSL (3/4)

• Put a check mark on “Windows Subsystem for Linux”.
• Click “OK” button.
Activation of WSL (4/4)

• Wait a few minutes
• Restart Windows when Windows completed the requested changes
Installation of Ubuntu (1/7)

- Go to Microsoft Store and search “Ubuntu”.
- Select Linux OS and click icon.

Click “Search” button and enter “Ubuntu”

No version number Ubuntu is recommended
Installation of Ubuntu (2/7)

• Click “Get” button
Installation of Ubuntu (3/7)

- Sign in Microsoft account if you needed
Installation of Ubuntu (4/7)

• Launch up “Ubuntu” in the program list
Installation of Ubuntu (5/7)

• Open Ubuntu terminal
• Start remaining installation work when you launch up Ubuntu.
  • Wait about 10 minutes.
• After installation, Ubuntu requires user name and password.
  • This user name and password are not related to the Windows account.
  • Password is required for sudo command.
  • User name of this example is “tada”.

Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your Windows username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username:
Installation of Ubuntu (7/7)

- Installation procedure is completed when you enter user name and password.

```
tada@DESKTOP-8DR8GSO:~
pwd: password updated successfully
Installation successful!
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 4.4.0-18362-Microsoft x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Thu Aug 27 18:37:41 JST 2020

System load: 0.52 Processes: 7
Usage of /home: unknown Users logged in: 0
Memory usage: 36% IPv4 address for eth1: [REDACTED]
Swap usage: 0%

0 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

tada@DESKTOP-8DR8GSO:~
```
How to access Ubuntu directory?

• Absolute path of Ubuntu directory
  • \wsl$\Ubuntu
Efficient use of Ubuntu on WSL

- Setting up a link to the desktop directory of Windows
- User can easily exchange data from Windows to Ubuntu.
Launch up Ubuntu at desired directory

- Ubuntu can be launched from any directory
  - Open desired directory and enter “wsl” on address bar.

Start Ubuntu from desktop directory
Launch up Ubuntu from command prompt

- Enter “wsl” on command prompt
Installation of development tools
Development tools

- Following development tools are required to compilation of FRENDY.
  - tcsh: Shell
  - gcc, make: Compiler
  - Boost, Lapack, Blas, Eigen: Library

- Please ask to the administrator before installing above tools.
Update and installation of tcsh

• Update Ubuntu OS
  • `sudo apt-get update`
  • `sudo apt-get upgrade`

• Installation of tcsh
  • `sudo apt-get install tcsh`
  • For CentOS: `sudo yum install tcsh`

Please enter green commands on Ubuntu terminal
Installation of compilers and libraries

• Installation of gcc and make
  • `sudo apt-get install build-essential`
  • Wait for a few minutes
    • For CentOS: `sudo yum install gcc`

• Installation of Boost library
  • `sudo apt-get install libboost-all-dev`
  • Wait about 10 minutes.
    • For CentOS: `sudo yum install boost boost-devel`

• Installation of Lapack and Blas
  • `sudo apt-get install liblapack-dev libblas-dev`
  • Wait about 10 minutes.
    • For CentOS: `sudo yum install lapack-devel blas-devel`
Installation of Eigen library

- Installation of Eigen library
  - Eigen library is not required for FRENODY
  - Eigen library is required for random sampling tool.
  - `sudo apt-get install libeigen3-dev`

- CentOS does not prepare the install package
  - User has to download Eigen manually.
  ① Get Eigen3 from following website.
  ② Decompress downloaded file.
  ③ Setting up a link to ”eigen-3.X.X/Eigen” at FRENODY directory, e.g., “frendy_YYYYYMMDD”
Compilation of FRENDY
Get FRENDY from JAEA website

- Everyone can download FRENDY from following web site:
Decompression of FRENDY

- Get FRENDY from JAEA web site.
  - File name: frendy_YYYYMMDD.tar.gz
  - “YYYYMMDD” means release date

- Decompression of FRENDY
  - `tar -xvzf frendy_YYYYMMDD.tar.gz`
Directory structure of FRENDY

- **frendy_YYYYMMDD**
  - **frendy**
    - compile_all.csh
    - main/frendy.exe
  - **tools**
    - make_perturbation_factor (random sampling tool)
    - perturbation_ace_file (ACE file perturbation tool)
  - **sample**
  - **tests**
    - run_all_class.csh
  - **README, README_jp**
  - **Updatelist.txt**

**FRENDY**
- Compilation shell
-Executable file

**Eigen**

**User has to modify link (See slide #30)**

**Test calculation shell**
Compilation of FRENDY

- Go to “frendy_YYYYMMDD/frendy”.
  - cd frendy_YYYYMMDD/frendy
- Run “compile_all.csh”
  - csh ./compile_all.csh
- Wait about 10 minutes.
- Warning message may be output on terminal.
  - Compilation will be OK if there is no fatal error message.
- Compilation is completed when following message is displayed
  - “### Completed to make FRENDY ###”
- Executable file (frendy/main/frendy.exe) is generated.
Running sample program of FRENDY

• Go to “frendy_YYYYMMDD/sample/run”.
  • cd sample/run
• Running run_frendy.csh shell.
  • csh ./run_frendy.csh
• Several nuclides and materials are automatically processed and corresponding ACE files are generated.
  • H-001, C-000, O-016, Fe-056, Xe-135, Gd-155, U-235, U238, Pu-238, and Pu-239
  • HinH3O, para-H, ortho-H, and graphite
  • Wait about 20~30 minutes.
• ACE file is generated in “col_data” directory
  • ACE file: j40a00fa for nuclides and f40a00ta for TSL data
  • XSDIR file : xsdir.j40a00f for nuclides and xsdir.j40a00t for TSL data
Compilation of random sampling tool

- User has to compile FRENDY before compilation of this tool.
- Go to “frendy_YYYYMMDD/tools/make_perturbation_factor”.
  - cd tools/make_perturbation_factor
- Setting up a link to Eigen at “make_perturbation_factor” directory.
  - ln -s /usr/include/eigen3/Eigen/ ./
    - Please remove existing Eigen file
- Compilation of random sampling tool.
  - make
- Running sample calculation.
  - cd sample
  - csh ./run_make_perturbation_factor.csh
  - Compilation of random sampling tool is successfully completed if there is no warning and 100 files are generated in “output/1001” directory.
    - File name of output files: “1001_0001” ~ “1001_0100”
Compilation of ACE file perturbation tool

• User has to compile FRENDY before compilation of this tool.

• Go to “frendy_YYYYMMDD/tools/perturbation_ace_file”
  • cd tools/perturbation_ace_file

• Compilation of ACE file perturbation tool
  • make

• Running sample calculation.
  • User has to run sample of random sampling tool.
  • cd sample
  • csh ./run_perturbation_ace_file.csh

• Compilation of random sampling tool is successfully completed if there is no warning and 100 directories are generated in “output” directory.
  • Directory name: “0001” ~ “0100”