

An example of How to install HEP tools on Mac OS X

November 11, 2015. KH. Thanks to Endo-san and Ishikawa-kun!!

v1: October 9, 2015. Mainly `Herwig++` and `CheckMATE`.

v2: November 11, 2015. (Thanks to Nojiri-san's note.) `gcc` link removed. `CheckMATE` installation modified. `Pythia` added.

1. We assume that none of the following tools are installed, like just after clean-installing a new OS X 10.11 El Capitan.
2. (This is optional.) Download and install `Xcode` from Apple store.
3. Open the "Terminal".
4. Install `Command Line Tools`.

```
$ xcode-select --install
```

5. Install `homebrew`. (Google `homebrew`.)

```
$ ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

In the following, if there is any problem with homebrew, try

```
$ brew update
```

```
$ brew doctor
```

6. Install `gcc` via homebrew.

```
$ brew install gcc
```

Currently it is `gcc-5`. They are located at `/usr/local/Cellar/gcc/5.2.0`.

7. If not yet done,¹ set the symbolic link `gfortran` → `gfortran-5`.

```
$ ln -s /usr/local/bin/gfortran-5 /usr/local/bin/gfortran
```

8. Install `python` via homebrew.

```
$ brew install python
```

and then (necessary for CheckMATE)

```
$ pip install numpy
```

```
$ pip install scipy
```

```
$ pip install matplotlib
```

9. Install `root` via homebrew. (Note that, for CheckMATE, we should NOT use `root 6`, but `root 5`. See CheckMATE homepage. Currently, if we install from `homebrew/science/root`, it is automatically `root 5`.)

```
$ brew tap homebrew/science
```

¹If you start from clean-installed OS X, it is probably already symbolic-linked at this stage. Check `$ gfortran -v`. If it returns something like `gcc version 5.2.0 (Homebrew gcc 5.2.0)`, then it is already symbolic-linked.

```
$ brew install homebrew/science/root
```

You can check the version of the `root` by

```
$ root
```

10. Tap `homebrew-hep` via homebrew. (Google `homebrew-hep` .)

```
$ brew tap davidchall/hep
```

You can download → configure → make many HEP tools using homebrew-hep, e.g., `herwig++`, `pythia8`, etc etc. Here, I concentrate on `herwig++`.

```
$ brew install herwig++
```

All the necessary packages, such as `thepeg`, `hepmc`, etc etc, are automatically downloaded and linked.

11. `CheckMATE`. See the CheckMATE webpage and its Installation Tutorial.

```
$ python -V
Python 2.7.10
$ which root
/usr/local/bin/root
$ root-config --has-python --has-roofit --has-minuit2
yes yes yes
```

Download CheckMATE. (Currently `CheckMATE-1.2.2`.)

```
$ cd CheckMATE-1.2.2
$ ./configure CC=clang CPP=clang CXX=clang++ CXXCPP=clang++
```

Finally

```
$ make
```

It worked !

12. Now at least `Herwig++` → `CheckMATE` works. (See e.g., CheckMATE Tutorial, not the “Installation Tutorial” but the “CheckMATE Online Tutorial”.)

13. `Pythia8`. According to Nojiri-san and Endo-san, the version in homebrew is an old version and with bug. (November 2015). So let’s install it manually. Download the Pythia8 (currently `pythia8212`) and

```
$ cd pythia8212
$ ./configure --with-hepmc2 --with-fastjet3 --with-lhapdf6 --with-boost
$ make
```

Now go to examples directory

```
$ cd examples
```

and check

```
$ make main41
```

```
$ ./main41
```

and

```
$ make main14
```

```
$ ./main14
```

It runs successfully!!

References