Compiling and running Fortran, C, and C++ programs on *Kraken. Draft version 2012.01.11*

We shall assume that your program is ready to compile. Each language has its own compile command, however the syntax is the same. If your program name is test.f, test.c, or test.cpp, the three commands, respectively would be

bccd@node000:~$ gfortran -o test test.f

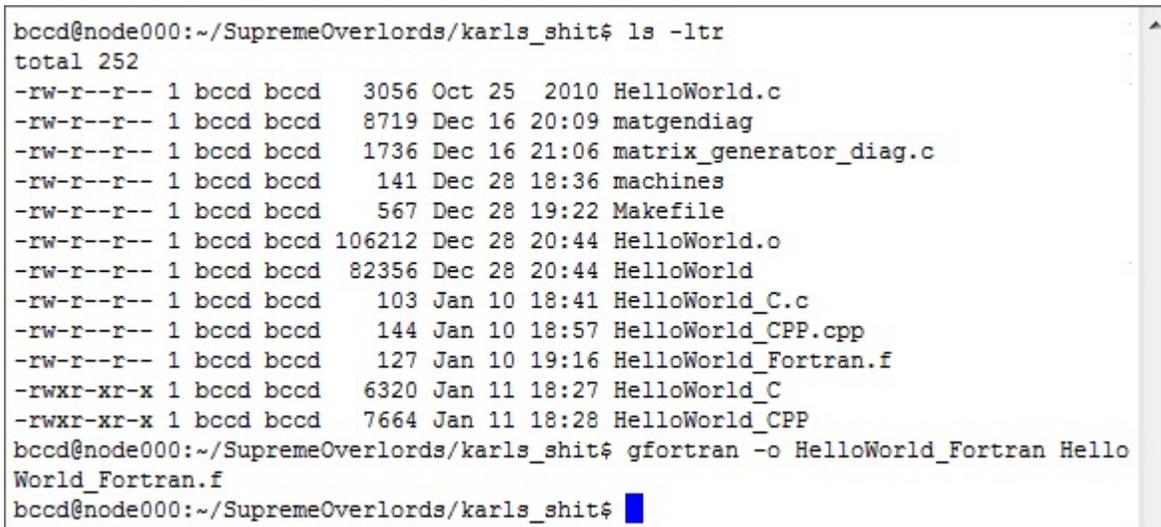bccd@node000:~$ gcc -o test test.c

bccd@node000:~$ g++ -o test test.cpp

If compiled correctly, you will get another prompt. The standard format for compiling is as follows:

bccd@node000:~$ g*language* -o executable_name program_name.*language*

As an example, if I have a program named HelloWorld_Fortran.f, then I can compile, as in the following image:

```
bccd@node000:~/SupremeOverlords/karls_shit$ ls -ltr
total 252
-rw-r--r-- 1 bccd bccd   3056 Oct 25  2010 HelloWorld.c
-rw-r--r-- 1 bccd bccd   8719 Dec 16 20:09 matgendiag
-rw-r--r-- 1 bccd bccd   1736 Dec 16 21:06 matrix_generator_diag.c
-rw-r--r-- 1 bccd bccd    141 Dec 28 18:36 machines
-rw-r--r-- 1 bccd bccd    567 Dec 28 19:22 Makefile
-rw-r--r-- 1 bccd bccd 106212 Dec 28 20:44 HelloWorld.o
-rw-r--r-- 1 bccd bccd  82356 Dec 28 20:44 HelloWorld
-rw-r--r-- 1 bccd bccd    103 Jan 10 18:41 HelloWorld_C.c
-rw-r--r-- 1 bccd bccd    144 Jan 10 18:57 HelloWorld_CPP.cpp
-rw-r--r-- 1 bccd bccd    127 Jan 10 19:16 HelloWorld_Fortran.f
-rwxr-xr-x 1 bccd bccd   6320 Jan 11 18:27 HelloWorld_C
-rwxr-xr-x 1 bccd bccd   7664 Jan 11 18:28 HelloWorld_CPP
bccd@node000:~/SupremeOverlords/karls_shit$ gfortran -o HelloWorld_Fortran Hello
World_Fortran.f
bccd@node000:~/SupremeOverlords/karls_shit$ █
```

As you can see, a new command prompt has popped up. If your program did not compile, you would receive error/warning messages. Although, if you only have warning messages, then you should have still ended up with a compiled program.

So if we go ahead and list the directory again, there should be a new file (an executable), named HelloWorld_Fortran.

```
-rw-r--r-- 1 bccd bccd  82356 Dec 28 20:44 HelloWorld
-rw-r--r-- 1 bccd bccd    103 Jan 10 18:41 HelloWorld_C.c
-rw-r--r-- 1 bccd bccd    144 Jan 10 18:57 HelloWorld_CPP.cpp
-rw-r--r-- 1 bccd bccd    127 Jan 10 19:16 HelloWorld_Fortran.f
-rwxr-xr-x 1 bccd bccd   6320 Jan 11 18:27 HelloWorld_C
-rwxr-xr-x 1 bccd bccd   7664 Jan 11 18:28 HelloWorld_CPP
bccd@node000:~/SupremeOverlords/karls_shit$ gfortran -o HelloWorld_Fortran Hello
World_Fortran.f
bccd@node000:~/SupremeOverlords/karls_shit$ ls -ltr
total 260
-rw-r--r-- 1 bccd bccd   3056 Oct 25  2010 HelloWorld.c
-rw-r--r-- 1 bccd bccd   8719 Dec 16 20:09 matgendiag
-rw-r--r-- 1 bccd bccd   1736 Dec 16 21:06 matrix_generator_diag.c
-rw-r--r-- 1 bccd bccd    141 Dec 28 18:36 machines
-rw-r--r-- 1 bccd bccd    567 Dec 28 19:22 Makefile
-rw-r--r-- 1 bccd bccd 106212 Dec 28 20:44 HelloWorld.o
-rw-r--r-- 1 bccd bccd  82356 Dec 28 20:44 HelloWorld
-rw-r--r-- 1 bccd bccd    103 Jan 10 18:41 HelloWorld_C.c
-rw-r--r-- 1 bccd bccd    144 Jan 10 18:57 HelloWorld_CPP.cpp
-rw-r--r-- 1 bccd bccd    127 Jan 10 19:16 HelloWorld_Fortran.f
-rwxr-xr-x 1 bccd bccd   6320 Jan 11 18:27 HelloWorld_C
-rwxr-xr-x 1 bccd bccd   7664 Jan 11 18:28 HelloWorld_CPP
-rwxr-xr-x 1 bccd bccd   7441 Jan 11 18:34 HelloWorld_Fortran
bccd@node000:~/SupremeOverlords/karls_shit$
```

And since we did a listing in time order, reversed, the most recently created program shows up at the bottom of the list.

We can now execute the program, under the assumption that it needs no extra parameters using the command:

bccd@node000:~$ ./HelloWorld_Fortran

The ./ tells the OS to include the current directory, of which you are working in, when it looks for the executable named "HelloWorld_Fortran". Else, the OS uses the standard path of /usr or /usr/bin to look for the executable.

```
-rwxr-xr-x 1 bccd bccd   7664 Jan 11 18:28 HelloWorld_CPP
-rwxr-xr-x 1 bccd bccd   7441 Jan 11 18:34 HelloWorld_Fortran
bccd@node000:~/SupremeOverlords/karls_shit$ ./HelloWorld_Fortran
 Goodbye Cruel World!
bccd@node000:~/SupremeOverlords/karls_shit$
```

The same process is used to compile and run C and C++ programs. We compile and execute simple C program last, as you will be compiling C programs most frequently of the three.

Step 1 – Compile

```
bccd@node000:~/SupremeOverlords/karls_shit$ ls -ltr
total 252
-rw-r--r-- 1 bccd bccd    3056 Oct 25  2010 HelloWorld.c
-rw-r--r-- 1 bccd bccd    8719 Dec 16 20:09 matgendiag
-rw-r--r-- 1 bccd bccd    1736 Dec 16 21:06 matrix_generator_diag.c
-rw-r--r-- 1 bccd bccd     141 Dec 28 18:36 machines
-rw-r--r-- 1 bccd bccd     567 Dec 28 19:22 Makefile
-rw-r--r-- 1 bccd bccd  106212 Dec 28 20:44 HelloWorld.o
-rw-r--r-- 1 bccd bccd   82356 Dec 28 20:44 HelloWorld
-rw-r--r-- 1 bccd bccd     103 Jan 10 18:41 HelloWorld_C.c
-rw-r--r-- 1 bccd bccd     144 Jan 10 18:57 HelloWorld_CPP.cpp
-rw-r--r-- 1 bccd bccd     127 Jan 10 19:16 HelloWorld_Fortran.f
-rwxr-xr-x 1 bccd bccd    7664 Jan 11 18:28 HelloWorld_CPP
-rwxr-xr-x 1 bccd bccd    7441 Jan 11 18:34 HelloWorld_Fortran
bccd@node000:~/SupremeOverlords/karls_shit$ gcc -o HelloWorld_C HelloWorld_C.c
bccd@node000:~/SupremeOverlords/karls_shit$
```

Step 2 – Verify that your program was created, we are looking for HelloWorld_C

```
-rwxr-xr-x 1 bccd bccd    7441 Jan 11 18:34 HelloWorld_Fortran
bccd@node000:~/SupremeOverlords/karls_shit$ gcc -o HelloWorld_C HelloWorld_C.c
bccd@node000:~/SupremeOverlords/karls_shit$ ls -ltr
total 260
-rw-r--r-- 1 bccd bccd    3056 Oct 25  2010 HelloWorld.c
-rw-r--r-- 1 bccd bccd    8719 Dec 16 20:09 matgendiag
-rw-r--r-- 1 bccd bccd    1736 Dec 16 21:06 matrix_generator_diag.c
-rw-r--r-- 1 bccd bccd     141 Dec 28 18:36 machines
-rw-r--r-- 1 bccd bccd     567 Dec 28 19:22 Makefile
-rw-r--r-- 1 bccd bccd  106212 Dec 28 20:44 HelloWorld.o
-rw-r--r-- 1 bccd bccd   82356 Dec 28 20:44 HelloWorld
-rw-r--r-- 1 bccd bccd     103 Jan 10 18:41 HelloWorld_C.c
-rw-r--r-- 1 bccd bccd     144 Jan 10 18:57 HelloWorld_CPP.cpp
-rw-r--r-- 1 bccd bccd     127 Jan 10 19:16 HelloWorld_Fortran.f
-rwxr-xr-x 1 bccd bccd    7664 Jan 11 18:28 HelloWorld_CPP
-rwxr-xr-x 1 bccd bccd    7441 Jan 11 18:34 HelloWorld_Fortran
-rwxr-xr-x 1 bccd bccd    6320 Jan 11 18:49 HelloWorld_C
bccd@node000:~/SupremeOverlords/karls_shit$
```

Step 3 – Now run the executable (HelloWorld_C)

```
-rwxr-xr-x 1 bccd bccd    7441 Jan 11 18:34 HelloWorld_Fortran
-rwxr-xr-x 1 bccd bccd    6320 Jan 11 18:49 HelloWorld_C
bccd@node000:~/SupremeOverlords/karls_shit$ ./HelloWorld_C
Goodbye Cruel World!
bccd@node000:~/SupremeOverlords/karls_shit$
```

Step 4 – Rejoice!