

DEVELOPING YOUR OWN MADAGASCAR PROGRAMS

JEFFREY SHRAGGE & AARON GIRARD

In this exercise you will complete the “geophysics” into a simple C and/or f90 program, and then compile and use it to run a sample calculation.

1. Building Your Program

- (1) Take your copy of SCHOOL_CODE.tgz and do the following steps:
 - **mkdir \$RSFSRC/user/yourname/**
 - **cp SCHOOL_CODE.tgz \$RSFSRC/user/yourname/**
 - **cd \$RSFSRC/user/yourname/**
 - **tar -xzvf SCHOOL_CODE.tgz**
- (2) Check to see whether your compilers are working. Open your *Sconstruct* file with your favourite text editor (e.g., **vi SConstruct**) and see which programs are included in the *targets.c* and *targets.f90* blocks. This is where you list the names of your programs (in C and F90, respectively) to let Madagascar know which programs to compile. Program names must begin with an upper-case **M** for the **Main** program. You see that there are C and F90 *helloworld* programs. Compile these by doing the following steps in your \$RSFSRC/user/yourname/ directory:
 - **scons sfhelloworld_C**
 - **scons sfhelloworld_fortran**
 - Now test the C program out with: **./sfhelloworld_C**
 - Now test the F90 program out with: **./sfhelloworld_fortran**
 - How many cores does your computer have?
- (3) You have a copy of an *almost finished* “vector addition” code in C and f90.
 - \$RSFSRC/user/yourname/Mvectoradd_C.c
 - \$RSFSRC/user/yourname/Mvectoradd_fortran.f90Your assignment is to put the “geophysics” into one of the vector addition codes. Open the file in a text editor and complete the **C = A + B** assignment.
 - Hint: Vector index in F90 is **A()**; Vector index in C is **A[]**.
- (4) After completing this task build the code in the local directory by:
 - Type: **scons sfvectoradd_C**
 - Type: **scons sfvectoradd_fortran**
- (5) You may (optionally) install the C or f90 program into \$RSFR00T/bin/ by
 - Type: **cd \$RSFSRC/ ; scons install**

2. Testing Your Program

- (6) Go to your working directory (e.g. **cd /path/to/work/dir/**). You will have to make a *SConstruct* file and add the rules we need to test your *sfvectoradd_C* or *sfvectoradd_fortran* program.
- (7) Create two random vectors, *A.rs* and *B.rs*, of the same length and add them together using a Madagascar program. There is more than one way to do this: Try searching **sfdoc -k math**

- (8) Construct a *Flow* rule to obtain *C.rsf* from existing files *A.rsf* and *B.rsf* using your *sfvectoradd_C* or *sfvectoradd_fortran* program.
- (9) Do you know that you got the correct answer? Let's test our program against a (correct) Madagascar program: *sfmath*. Write a final *Flow()* rule to do this.