Modifying JAGS on Mac

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These steps will allow you to modify JAGS and install it. Unfortunately, before installing you need to compile JAGS and this has to be done in the same computer where you want it to be installed, so we can't just follow a Linux guide. Also, we assume you have already installed R in your computer.

1. Download the last version of JAGS source code from this link: https://sourceforge.net/projects/mcmc-jags/files/JAGS/4.x/Source/. Open the .tar file so you get a folder named JAGS-4.2.0 where we will work on step 2.

2. Go to JAGS-4.2.0/src/modules/bugs/functions. You have to put in this file your new function in form of .cc and .h files. You can copy SFactor.cc and SFactor.h from section 6.7.2 in Kevin Anderson's report and modify them. (If more info is needed, read section 6.5 in Kevin Anderson's report)

3. Install *Homebrew* from http://brew.sh. You just have to copy and paste a line in the Terminal (see images below). To open the Terminal, you can just press Cmd+spacebar (open Spotlight), type in "Terminal" (without quotes) and press Enter key.

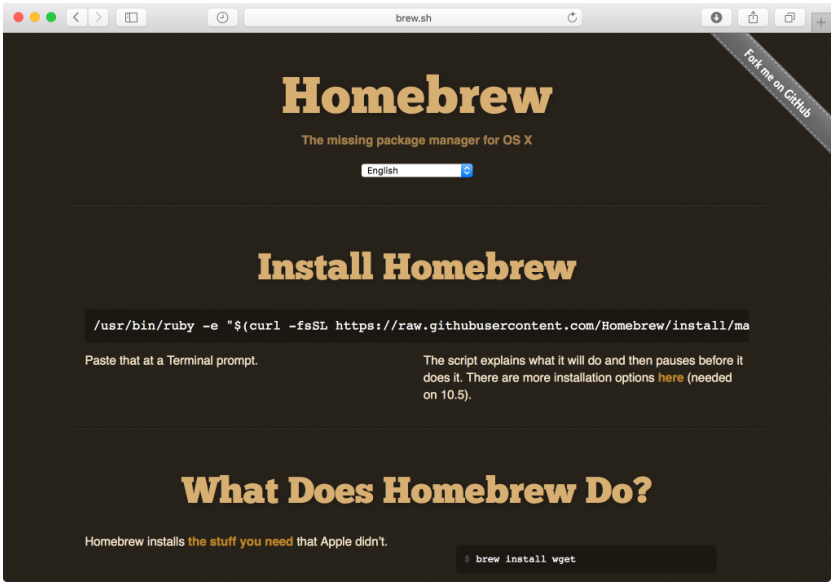

Fig. 1 - *Homebrew* web site.

Homebrew is a package that allows you to install other packages in a really easy way (you need to be connected to the internet to use it).

4. Now you need to install the packages Kevin lists in section 6.2. Some of them may be already installed if you have used fortran or Xcode, for example (I recommend installing Xcode since it provides your computer with many packages you may need at some point in your work). Write *brew install [name of the package]* in the Terminal to install. I had Xcode so the only packages I needed were:

brew install gcc

brew install gfortran

brew install autoconf

brew install automake

brew install libtool

brew install cppunit (Kevin does not actually list this one but it is the equivalent of libcppunit-dev in Mac)

*NOTE: If you have problems of privileges at some point when you try to execute a command in the Terminal, just write *sudo* before it. It will ask you for your admin password. Write it (you won't see it in the screen) and press Enter.

5. Now we have to modify two files before recompiling JAGS. Go to JAGS-4.2.0/src/modules/bugs/functions/Makefile.am. There are two lists in this file, one for .cc files and one for .h files. Just add your new function to these lists.

Makefile.am

```
noinst_LTLIBRARIES = libbugsfunc.la

libbugsfunc_la_CPPFLAGS = -I$(top_srcdir)/src/include       \
-I$(top_srcdir)/src/modules/bugs/matrix \
-I$(top_srcdir)/src/modules/bugs/distributions

libbugsfunc_la_LDFLAGS = -no-undefined -module -avoid-version

libbugsfunc_la_SOURCES = Max.cc Probit.cc InProd.cc Mean.cc SD.cc   \
ICLogLog.cc Min.cc Sqrt.cc CLogLog.cc ILogit.cc Step.cc Log.cc Sum.cc       \
Exp.cc LogFact.cc LogGam.cc Phi.cc Logit.cc Inverse.cc LogDet.cc    \
Sort.cc Rank.cc Abs.cc Cos.cc Sin.cc Tan.cc Cosh.cc Sinh.cc Tanh.cc \
ArcCos.cc ArcSin.cc ArcTan.cc ArcCosh.cc ArcSinh.cc ArcTanh.cc              \
InterpLin.cc Round.cc Trunc.cc Equals.cc Prod.cc MatMult.cc         \
Transpose.cc DSumFunc.cc DIntervalFunc.cc DRoundFunc.cc IfElse.cc   \
Order.cc Combine.cc Rep.cc SFactor.cc sfactorTdn.cc

noinst_HEADERS = LogGam.h Phi.h Sum.h Log.h Logit.h Probit.h        \
CLogLog.h InProd.h Max.h SD.h ICLogLog.h Mean.h Sqrt.h ILogit.h Min.h       \
Step.h Exp.h LogFact.h Inverse.h LogDet.h Sort.h Rank.h Abs.h Cos.h \
Sin.h Tan.h Cosh.h Sinh.h Tanh.h ArcCos.h ArcSin.h ArcTan.h ArcCosh.h        \
ArcSinh.h ArcTanh.h InterpLin.h Round.h Trunc.h Equals.h Prod.h             \
MatMult.h Transpose.h DSumFunc.h DIntervalFunc.h DRoundFunc.h               \
IfElse.h Order.h Combine.h Rep.h SFactor.h sfactorTdn.h

### Test library

check_LTLIBRARIES = libbugsfuntest.la
libbugsfuntest_la_SOURCES = testbugsfun.cc testbugsfun.h
libbugsfuntest_la_CPPFLAGS = -I$(top_srcdir)/src/include
```

Fig. 2 - "Makefile.am" file. In this example, there are two new functions added: *SFactor* and *sfactorTdn*.

Go to JAGS-4.2.0/src/modules/bugs/bugs.cc, where you will find two long lists of *#include* and *insert(new SFactor)* statements for all the functions. Just add do the same for your new function.

bugs.cc

```
#include <functions/SD.h>
#include <functions/Sin.h>
#include <functions/Sinh.h>
#include <functions/Sort.h>
#include <functions/Sqrt.h>
#include <functions/Step.h>
#include <functions/Sum.h>
#include <functions/Tan.h>
#include <functions/Tanh.h>
#include <functions/Transpose.h>
#include <functions/Trunc.h>
#include <functions/SFactor.h>
#include <functions/sfactorTdn.h>

#include <function/DFunction.h>
#include <function/PFunction.h>
#include <function/QFunction.h>
```

bugs.cc

```
    insert(new Sin);
    insert(new Sinh);
    insert(new Sort);
    insert(new Sqrt);
    insert(new Step);
    insert(new Sum);
    insert(new Tan);
    insert(new Tanh);
    insert(new Transpose);
    insert(new Trunc);
    insert(new SFactor);
    insert(new sfactorTdn);

    //Load observable functions
    insert(new DSum, new DSumFunc);
    insert(new DInterval, new DIntervalFunc);
```

Fig. 3 - "bugs.cc" file. In this example, there are two new functions added: *SFactor* and *sfactorTdn*.

6. Everything is ready to recompile JAGS. Change working folder of the Terminal to JAGS-4.2.0 by typing "*cd* " (there is a space after *cd*) and dragging the folder into the Terminal. Then press Enter. Finish the compilation:

autoreconf --force --install

./configure

make

sudo make install

NOTE: Any folder of your working path must not have any space, point, comma or accent (“ñ” is counted as an accent).

NOTE 2: If you get an error in a particular file, it may be caused by using this type of quotes: “. All quotes appearing inside a function should be like this: ".

NOTE 3: The first time we tried to modify JAGS, we got an error on line 3310 of a file (I can’t remember which one it was) and solved it by opening the file and simply commenting that line. We did not get that error any more (in any other computer).

7. You should have successfully installed JAGS with your new function.