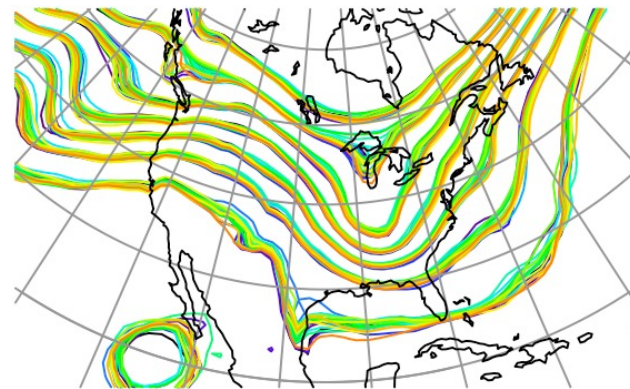


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Testbed



DART Tutorial Section 11: Creating DART Executables



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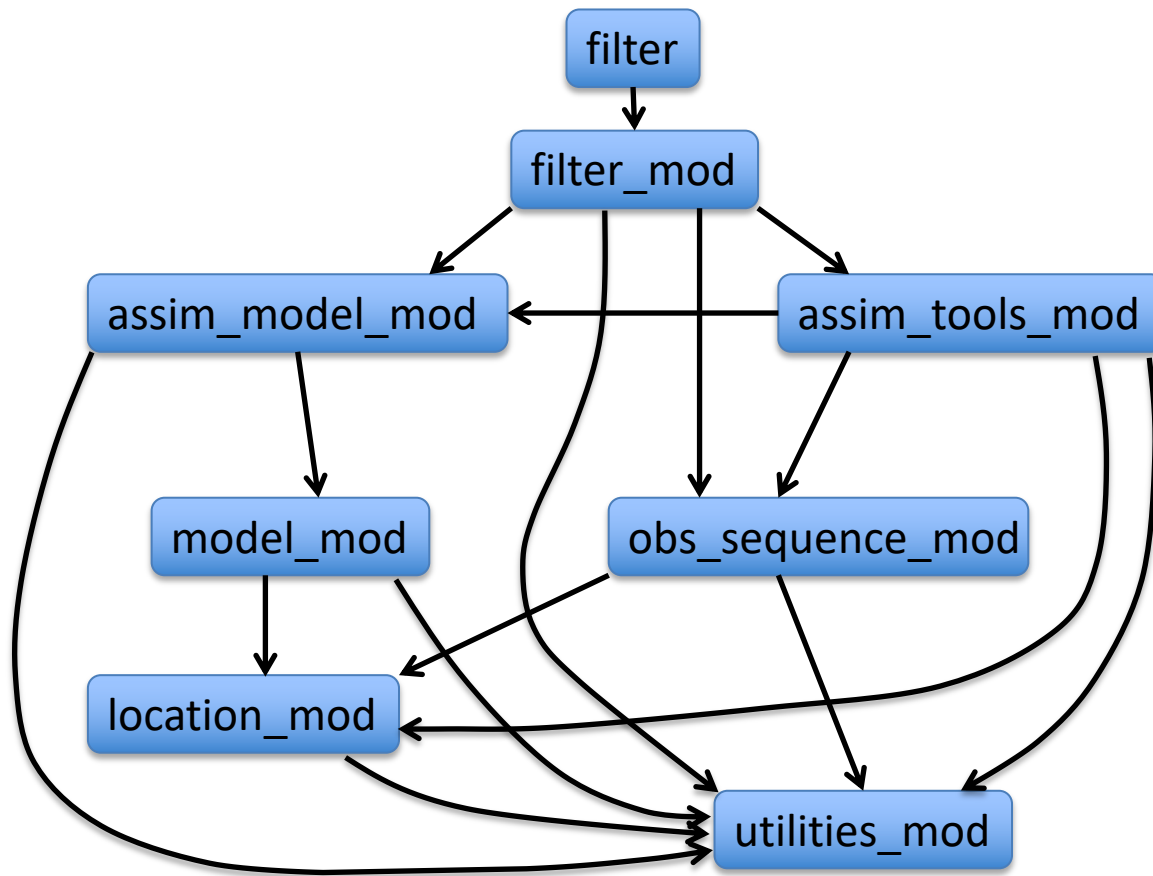
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Fortran 90 'Use' Trees

DART requires use of F90 *use module_mod, only*:

No other mechanism for use of 'external' routine.



Program viewed as
Directed Acyclic Graph
(tree with shared leaves)

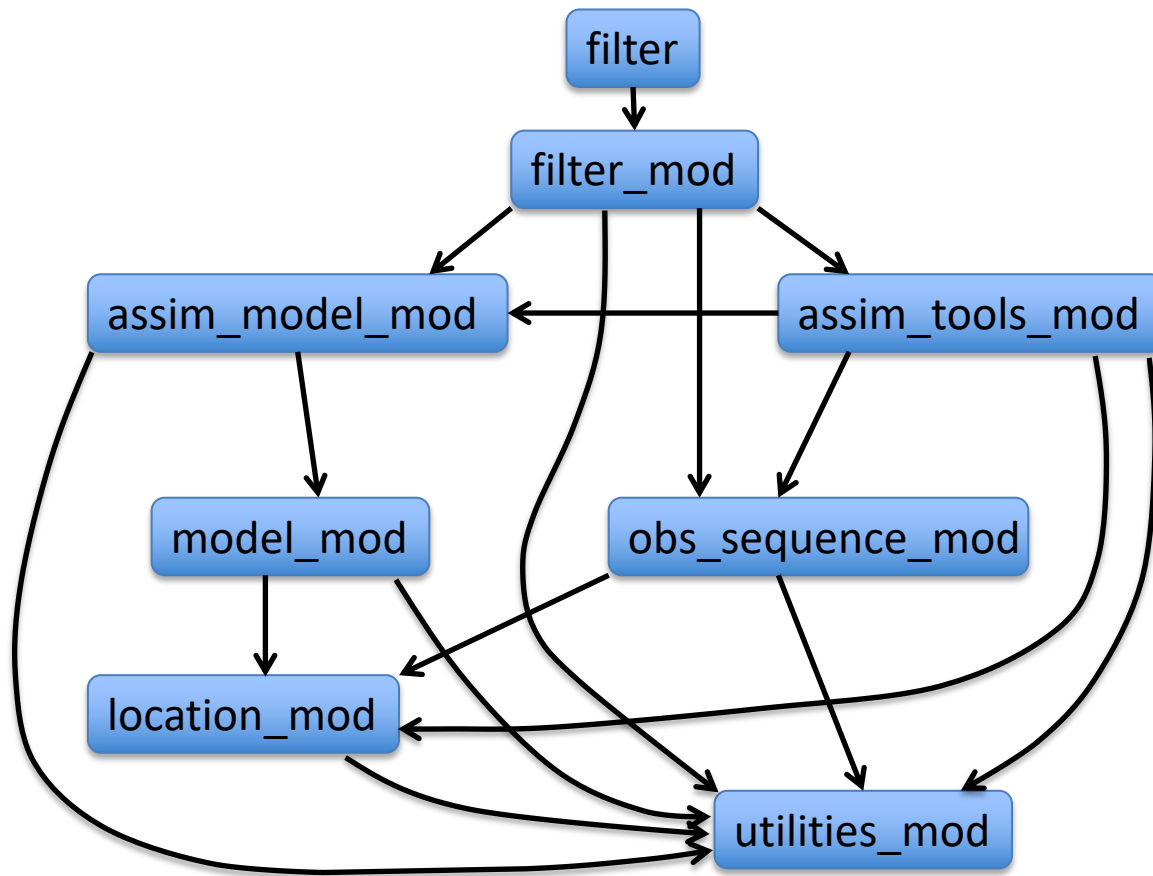
No cycles!

Partial tree for program
filter is shown.

Vector represents use of
target module.

Generating a Makefile with mkmf

DART requires use of F90 *use module_mod*, only:

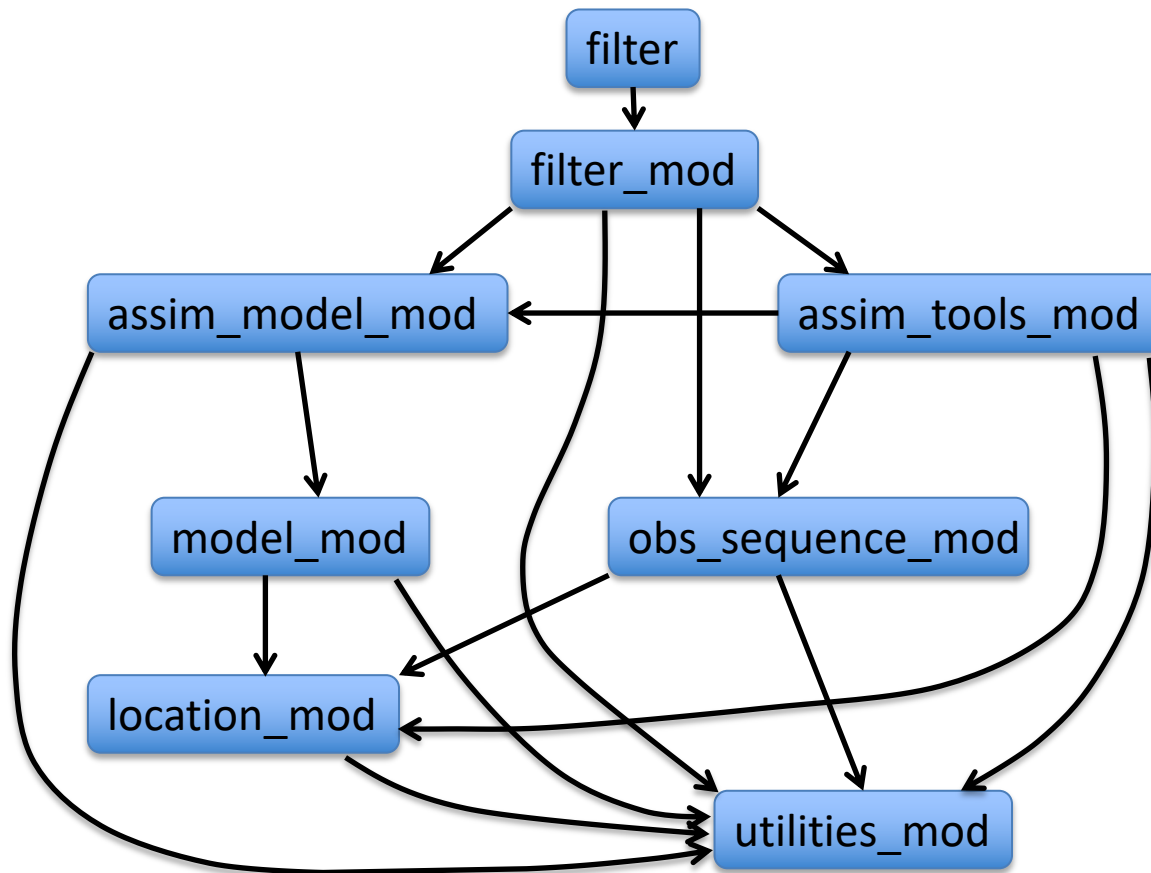


Use ***mkmf*** Perl script to make a *Makefile*

mkmf requires a list of files to search for the main program and modules that are used. This list of files is constructed during a run of ***quickbuild.sh***

Generating a Makefile with mkmf

DART requires use of F90 *use module_mod*, only:



mkmf searches files in `path_names` for one that contains *program filter*.

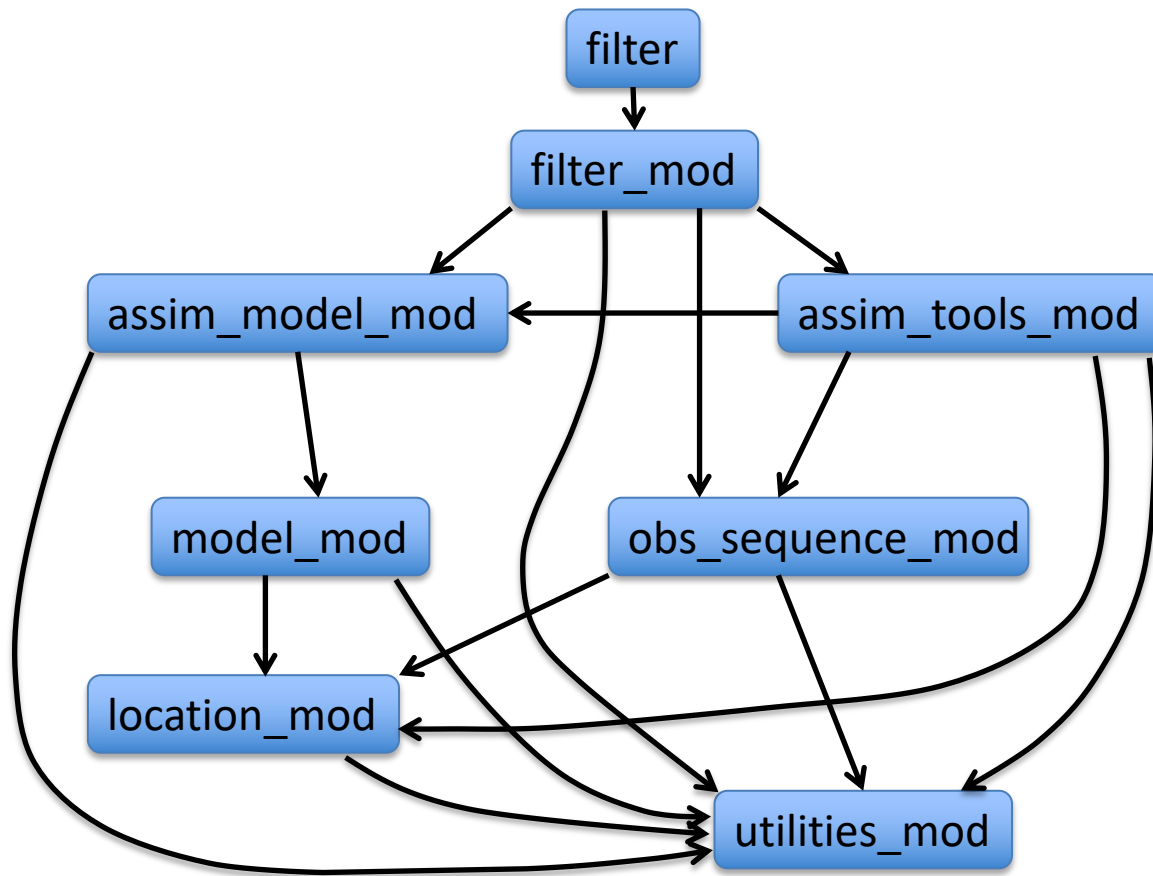
Finds first *use only* in filter.

Searches `path_names` files for this module recursively.

Builds a dependency graph like one at left.

Generating a Makefile with mkmf

DART requires use of F90 *use module_mod*, only:



From dependency graph, ***mkmf*** generates a standard *Makefile*.

Also creates a default namelist file, *input.nml.filter_default*.

Examine to see namelists required, default values.

Enter ***make*** to create filter executable.

mkmf Details

A variety of mkmf templates for different machines and compilers are available in the directory *build_templates* (You can also see the Perl script *mkmf* there).

mkmf templates specify:

- What compiler to use,

- Where to find the netCDF libraries,

- Compile and link command line options.

Templates usually include comments about useful compiler and linker options for both debugging and production.

To change your template:

- Copy the appropriate *mkmf.template.xxx* file to *mkmf.template* and make any needed changes.

mkmf Details

Two versions of the MPI module are available; one which really calls MPI and one with dummy routines.

The default is to build an MPI parallel version.

To build filter with MPI:

./quickbuild.sh filter

To build filter without MPI:

./quickbuild.sh nompi filter

Exercise: Compiling lorenz_63 filter program

models/lorenz_63/work/

1. Go to *models/lorenz_63/work*
2. Remove all files with *.o* and *.mod* extensions.
3. Generate a *Makefile* and *input.nml.filter_default* and compile filter by:
./quickbuild.sh nomp filter

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