1 Overview

The scmplus program is a version of the scm script that reduces the number of times that insignificant parameter-covariate relations are retested. The insignificant runs are often the most unstable and difficult to estimate, and they take a considerable amount of computing time. The method used is called Adaptive Scope Reduction. In one or more forward steps, the parameter-covariate relations that are insignificant relative to the chosen p-value cutoff are removed from the set of relations that are tested in the following steps. The removed, or stashed, relations are then optionally retested after the reduced scope scm forward search has terminated. The scmplus program depends on the scm tool of PsN, and all scm options apply also to scmplus. Please refer to scm_userguide.pdf for help on scm options.

Example:

```
scmplus run101.scm -scope_reduction_steps=1,2,3 -p_cutoff=0.05
```

2 Input and options

2.1 Required input

An scm configuration file is required on the command-line. The format of the configuration file follows the format of the scm configuration file exactly. The input model must be set in the configuration file, it cannot be given on the scmplus commandline.

No other option is required.

2.2 Optional input

These options are specific to scmplus, and they can only be given on the command-line, not in the scm configuration file.

-scope_reduction_steps = *comma-separated list of integers*
: Comma-separated list of steps after which to perform scope reduction. Default 1 (after first step only). To perform scope reduction after every forward step set -scope_reduction_steps=all To never perform scope reduction set -scope_reduction_steps=none

-retest_stashed_relations
: Default set. Unset with -no-retest_stashed_relations. If set then parameter-covariate relations that were stashed in scope reduction will be retested at the end of the forward search.

-p_cutoff = *number*
: Cutoff p-value in scope reduction. Default is equal to p_forward, which in turn has default value 0.05 if not set in the scm config file.

-keep_local_min
: Default set. Unset with -no-keep_local_min. If set then candidate models that terminated with local minimum are kept in scope reduction.

-keep_covariance
: By default the $COVARIANCE record will be deleted from the models, to save run time. If option -keep_covariance is set, the $COVARIANCE record will be kept.

−keep_tables

By default all $TABLE will be deleted from the models. If option -keep_tables is set, all $TABLE will be kept.

−maxevals = *number*

Default not set. If set to a decimal number, and the estimation method is classical, $EST MAXEVALS will be set to that number times the actual number of function evaluations in the base model, rounded down to the nearest integer and capped at 9999. If set to an integer smaller than 10000 will be interpreted as the new value of $EST MAXEVALS. A warning will be printed if the new integer value is less than or equal to 10. If set to an integer equal to or larger than 9999 then this option will be ignored by scmplus and passed on to common_options maxevals (see documentation for common options).

−ctype4

Default not set. If -ctype4 is set, and a classical estimation method is used, scmplus will ensure CTYPE=4 is set in $EST

−ignore_no_sigl

Default not set. If not set, scmplus will stop with an error message if SIGL is not set in $EST and ADVAN 6,8,9 or 13 is used. If set, and SIGL is not set, a warning will be printed but scmplus will run.

−fast

Default not set. If -fast is set, the scmplus defaults for options -ctype4, -retest_stashed_relations, -scope_reduction_steps and -maxevals will change to -ctype4 set, -retest_stashed_relations unset, -scope_reduction_steps=all and -maxevals=1.2
If any of those options are set individually, the individual setting will override the -fast defaults.

−etas

Default not set. If -etas is set, and a classical estimation method is used, scmplus will ensure record $ETAS is used in the model, that FILE is set to the phi-file of the base model of the current iteration, and that MCETA in $EST is set to at least 1.

−base_ofv = *number*

Only applicable when included_relations is set in the scm config file. Use this value as the ofv of the base model with included relations, i.e. do not run the base model with included relations but use this value instead.

−setup_only

Default not set. If -setup_only is set, scmplus will setup everything but not start the scm run.

2.3 Some common PsN-options useful with scmplus

For a complete list see common_options.pdf, or psn_options -h on the commandline.

−h or -?

Print the list of available options and exit.

−help

With -help all programs will print a longer help message. If an option name is given as argument, help will be printed for this option. If no option is specified, help text for all options will be printed.

−directory = *'string'*

Default scmplus_dirN, where N will start at 1 and be increased by one each time you run the script. The directory option sets the directory in which PsN will run NONMEM and where PsN-generated output files will be stored. You do not have to create the directory, it will be done for you. If you set -directory to a the name of a directory that already exists, PsN will run in the existing directory, except for scm, boot_scm and xv_scm that cannot be started in an existing directory.

−seed = *'string'*

You can set your own random seed to make PsN runs reproducible. The random seed is a string, so both -seed=12345 and -seed=JustinBieber are valid. It is important to know that because of the way the Perl pseudo-random number generator works, for two similar string seeds the random sequences may be identical. This is the case e.g. with the two different seeds 123 and 122. Setting the same seed guarantees the same sequence, but setting two slightly different seeds does not guarantee two different random sequences, that must be verified.

−clean = *'integer'*

Default 1. The clean option can take four different values:

0 Nothing is removed

1 NONMEM binary and intermediate files except INTER are removed, and files specified with option -extra_files.

2 model and output files generated by PsN restarts are removed, and data files in the NM_run directory, and (if option -nmqual is used) the xml-formatted NONMEM output.

3 All NM_run directories are completely removed. If the PsN tool has created modelfit_dir:s inside the main run directory, these will also be removed.

4 All NM_run directories and all m1 directories are completely removed.

−nm_version = *'string'*

Default is 'default'. If you have more than one NONMEM version installed you can use option -nm_version to choose which one to use, as long as it is defined in the [nm_versions] section in psn.conf, see psn_configuration.pdf for details. You can check which versions are defined, without opening psn.conf, using the command

```
psn -nm_versions
```

−threads = *'integer'*

Default 5 (if default PsN config file is used). Use the threads option to enable parallel execution of multiple models. This option decides how many models PsN will run at the same time, and it is completely independent of whether the individual models are run with serial NONMEM or parallel NONMEM. If you want to run a single model in parallel you must use options -parafile and -nodes. On a desktop computer it is recommended to not set -threads higher the number of CPUs in the system plus one. You can specify more threads, but it will probably not increase the performance. If you are running on a computer cluster, you should consult your system administrator to find out how many threads you can specify.

−version

Prints the PsN version number of the tool, and then exit.