

Coin-HSL

A collection of HSL packages for use with IPOPT

Latest version: 2024.05.15

HSL provides a number of linear solvers that can be used in IPOPT. We provide several different ways for IPOPT users to download our codes.

Which solver?

For general use we recommend HSL_MA97. For small or highly sparse problems use MA57. For huge problems use HSL_MA86 (if factors fit in memory) or HSL_MA77 (if they don't).

Solver	Free to all	Free to academics	Problem size	Parallel	Repeatable answers	Notes
MA27	<u>Yes</u>	Yes	Small	No	Yes	Outdated, relatively
						slow.
						Can be downloaded
						as a standalone
						package.
		Yes	Small /	Threaded	Yes	
MA57			Medium	BLAS		
HSL_MA77	,	Yes	Huge	Limited	Yes	Out-of-core
1161 14406	;	Yes	Large	Highly	No*	Designed for
HSL_MA86						multicore
HSL_MA97		Yes	Small /		Yes	Slower than
			Medium /	Yes		HSL_MA86 on large
			Large			problems

^{*} **Note:** HSL_MA86 achieves repeatable answers in serial, however when running in parallel operations may be reordered for better performance. This leads to different (but equally valid) solutions.

Performance tips

- Try different scaling options using solver specific settings in ipopt.opt.
- For many problems scaling is not necessary. In particular try "ma57_automatic_scaling no" when using MA57 on small problems.
- See our report On the effects of scaling on the performance of Ipopt for a review of these effects.
- When using HSL_MA86 or HSL_MA97 ensure MeTiS ordering is compiled into lpopt to maximize parallelism.

Category

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