

COMP SCI and SFWR ENG 4-6TE3
CES 722 and CES 723
Project for Graduate Students

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Project: Comparison of nonlinear optimization software packages

1. Download the student version of the AMPL modelling language package from the WEB page <http://www.ampl.com/> if you do not have access to the full version.
2. Use the NEOS server <http://www-neos.mcs.anl.gov/neos/> to make your computational experiments.
3. Use the following nonlinearly constrained optimization packages:
 - IPOPT [AMPL Input]
 - KNITRO [AMPL Input]
 - LANCELOT [AMPL Input]
 - MINOS [AMPL Input]
 - PENNON [AMPL Input]via the NEOS server for your computational experiments.
4. Visit the WEB page: <http://www.princeton.edu/~rvdb/ampl/nlmodels/>
 - Choose 5 models relevant to your own research directions;
 - Write the AMPL code of one nonlinear problem from your own research project;
 - Solve all the six models by using all the five solvers, via the NEOS server.
5. Write a critical, informative report about your computational experiences. Describe the problems, the main characteristics of the solvers and pay attention to evaluate the performance of the solvers on your test-set. Compare the solvers based on the computational results and properties of the problems you were solving.

Deadline to deliver your report: Five days before the final exam.

Note: You may use other modelling languages including AIMMS, GAMS, Yalmip/Matlab, CVX/Matlab, etc. for your project and run optimization tests on your own computer or server instead of NEOS. Instead of using 5 models from the Princeton web-page, you may use other models or additional nonlinear problems from your own research area. Please discuss all such project modifications with your instructor.