

MS4327 Optimisation Project 2017

February 28, 2017

You are asked to write Matlab code to perform the following tasks: (use the robust linesearch code to be found at <http://jkcray.maths.ul.ie/ms4327/m-files/LineSearch/>).

1. Either

(a) implement each of the of the following algorithms :

- the SDM
- Newton's method
- the BFGS algorithm.
- the inverse BFGS algorithm.
- the DFP algorithm.
- the inverse DFP algorithm.

or

(b) Implement each of the following algorithms :

- the SDM
- Newton's method
- the FR cgm
- the PR cgm
- the DY cgm (see Appendix 19 in <http://jkcray.maths.ul.ie/ms4327/Slides.pdf>).
- the "Hybrid" cgm (see Appendix 19 in <http://jkcray.maths.ul.ie/ms4327/Slides.pdf>).

2. Write a top-level script that calls each of your selected six algorithms.

3. Now run your code for $n = 10$ and gather data with multiple runs of your code that allows you to draw conclusions re the relative performance of the six algorithms.
4. Use the `perf.m` Matlab m-file at <http://jkcray.maths.ul.ie/ms4327/perf.m> and documented at <http://jkcray.maths.ul.ie/ms4327/DolanMor.pdf> to produce “performance plots” which allow your six competing methods to be compared graphically.
5. See <http://jkcray.maths.ul.ie/ms4327/perf.png> for an example of the output that `perf.m` can produce.
6.
 - You should submit a single zip file containing your m-files together with a short report in pdf format (generated using L^AT_EX) by midnight on Sunday 23 April (Week 12).
 - The report should include the graphics generated together with explanation of your code and analysis of the results.
 - A maximum of 30% of the marks for the module will be awarded for your completed project.
 - The clarity of your code and of your report will be taken into account.