OptimizationAnswers

September 1, 2018

1 Optimization Solutions

1.1 Problem 1

```
In [1]: f(x) = (1 - 8x[1] + 7x[1]^2 - 7/3 * x[1]^3 + x[1]^4 / 4)*x[2]^2 * exp(-x[2])
        using Optim
        Optim.optimize(f,[2.0,2.0])
```

```
Out[1]: Results of Optimization Algorithm
         * Algorithm: Nelder-Mead
         * Starting Point: [2.0,2.0]
         * Minimizer: [4.000080592514454,1.9999322044270897]
         * Minimum: -2.345812e+00
         * Iterations: 31
         * Convergence: true
           *  ((y-y)š)/n < 1.0e-08: true
           * Reached Maximum Number of Iterations: false
         * Objective Calls: 64
```

1.2 Problem 2

```
In [2]: f(x) = cos(x[1])*sin(x[2])-x[1]/(x[2]^2+1)
        using BlackBoxOptim
        bboptimize(f,SearchRange = [(-1.0, 2.0),(-1.0,1.0)], NumDimensions = 2)
```

```
Starting optimization with optimizer DiffEvoOpt{FitPopulation{Float64},RadiusLimitedSelector,Bl
0.00 secs, 0 evals, 0 steps

Optimization stopped after 10001 steps and 0.11293697357177734 seconds
Termination reason: Max number of steps (10000) reached
Steps per second = 88553.81620124468
Function evals per second = 82966.6291176545
Improvements/step = 0.4316
Total function evaluations = 9370


Best candidate found: [2.0, 0.105783]
```

```
Fitness: -2.021806783
```

```
Out[2]: BlackBoxOptim.OptimizationResults("adaptive_de_rand_1_bin_radiuslimited", "Max number
```