fletchcr SIF

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The SIF file and literature refer to two different FLETCHCR functions, despite having the same name.

The literature references the following function:

$$f(x) = \sum_{i=1}^{n-1} 100\Big(x_{i+1} - x_i + 1 - x_i^2\Big)^2$$

Contrarily, the equation in the SIF file is

$$f(x) = \sum 100\Big(- x_i^2 + x_{i+1}\Big)^2 + \Big(- x_i + 1\Big)^2$$

The Julia file comparing the two is below:

```
module Wrapper

export wrapfun

using CUTEst
using NLPModels

function fletchcr(x::AbstractVector)
  println("Julia port of CUTEST's FLETCHCR")
  grad = zeros(size(x))
  sum = 0
  for i = 1:(length(x)-1)
    term1 = -x[i]^2 + x[i+1]
    term2 = -x[i]+1
    sum = sum + 100*term1^2 + term2^2
    grad[i] = grad[i] + 2*100*term1*-2*x[i] + 2*term2*-1
    grad[i+1] = grad[i+1] + 2*100*term1
  end
  return sum, grad
end

function wrapfun(x::AbstractVector,problem::String)
    nlp = CUTEstModel(problem, verbose=false)
    fx = obj(nlp, x)
    gx = grad(nlp, x)

    finalize(nlp)

    return convert(Float64,fx),convert(Array{Float64},gx)
end


y = ones(1000)
A = fletchcr(y)
B = wrapfun(y,"FLETCHCR")
print(A)
print(" ")
print(B)
print(" ")
end
```