On Wednesday, April 2, 2014 10:33:43 AM UTC-4, Reetsspacey wrote:
> Hi,
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>
> My problem is this: I have a non-linear equation, of the form y = exp(x)+x. I have a large matrix of Y values, and for each cell (Y-value) I would like to calculate a best-fit X. How can I do this???

The easiest way is to use Newton's method.

If you're trying to find the root of f(x), given a trial solution of x0, the next best solution is,
  x = x0 - f(x0) / f'(x0)
where f'(x0) is the derivative of the function. Now you have a new x0 and can try again for multiple iterations.

For you, this would be, in IDL language,
for i = 0, n_iter-1 do begin
  x = x0 - (x + exp(x) - y)/(1 + exp(x))
  x0 = x
endfor

Your function is very well behaved (no extrema) so you should be able to pick x0=0 as your starting point and then keep iterating until you achieve the desired precision.

Craig