Subject: Re: Optimization "AMOEBA"
Posted by Wout De Nolf on Fri, 18 Sep 2009 11:45:37 GMT
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On Fri, 18 Sep 2009 02:53:29 -0700 (PDT), Nicki
<nickireiter87@yahoo.de> wrote:

> Hey!
>
> I need some help with amoeba (i'm a total IDL beginner...). For a
> start (get to understand how it works) I want to solve a pretty
> simple, 1-dim. problem. I'm having a parabola -x^2+4x+9 and I want to
> get the maximum with the help of AMOEBA. How do I do that? (Let's say
> starting point P0=5 and scale is 4).
> This is what it looks like now:
>
>
>
> FUNCTION FUNC, P
> x=P[0]
> y=-x^2.+4.*x+5.
> ydes=9.1
> RETURN, MIN(ydes^2-y^2)
> END
>
> R=AMOEBA(1.0e-1, SCALE=5, P0=0.05, FUNCTION_VALUE=fval)
>
> PRINT, 'x_Value:', r, $
> 'error:', fval[0]
>
> END
>
> As a result i get for the x_value -1 and for the error - Inf.... But
> why?! I mean the maximum of the function is at x=2 and this is within
> the scale...
> Maybe somebody can give me some help

It should be more like the code below. I never used this, but AMOEBA
seems to search for the minimum of a scalar field f(x,y,z,...).

In your example:
f(x) = -x^2.+4.*x+5.

If "FUNC" returns -f(x) it will search for the minimum of -f(x) which
is the same as finding the maximum of f(x).

```
FUNCTION FUNC, P
x=P[0]
y=-x^2.+4.*x+5.
RETURN, -y[0]
END

pro test
R=AMOEBA(1.0e-1,SCALE=10,P0=[0.01], FUNCTION_VALUE=fval)
xmax=r[0]
ymax=-fval[0]

PRINT, 'x_Value:', xmax
PRINT, 'maximum:', ymax

window
x=0.1*findgen(80)-2
y=-x^2.+4.*x+5.
plot,x,y
plots,xmax[[0,0]],[!y.crange[0],ymax],psym=-2
plots,[!x.crange[0],xmax],ymax[[0,0]],psym=-2
end
```