
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 $P_0=5$ 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.crangle[0],ymax],psym=-2
plots,[!x.crangle[0],xmax],ymax[[0,0]],psym=-2
end
```
