
Subject: Re: Better Root Finder

Posted by jschwab@gmail.com on Sun, 15 Apr 2007 20:41:23 GMT

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On Apr 15, 12:55 am, "Max Watson" <max...@gmail.com> wrote:

> IDL's `fx_root` seems very limited; when I want to find the root of say
> $x^3 - 8$ with the initial guess vector `[-1,-100,100]`, IDL returns a
> complex number: (`-1.00000`, `1.73205`). Is there a way that
> `fx_root` can be easily modified so that it can find the right answer
> with a bad initial guess?

I wouldn't say that `fx_root` is limited from that example; it is finding (one of) the correct (complex) solutions.

If you are only solving polynomial equations and need to get all the real solutions, you could try `fz_roots`, which gives you all of the solutions to a given polynomial. Then pick off the real solutions, or whatever your desired "right answer" is.

I wouldn't say that's necessarily the best solution, but it's certainly one of the easiest.

Subject: Re: Better Root Finder

Posted by wlandsman@jhu.edu on Mon, 16 Apr 2007 00:01:03 GMT

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<jschwab@gmail.com> wrote in message

news:1176669683.157908.311410@b75g2000hsg.googlegroups.com.. .

> On Apr 15, 12:55 am, "Max Watson" <max...@gmail.com> wrote:
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>> `fx_root` can be easily modified so that it can find the right answer
>> with a bad initial guess?

I think that the previous suggestion of using `FZ_ROOTS` if you have a polynomial, or is the way to go, but in the off-chance that you are only interested in cubic polynomial equations, as in your example, *and* you are only interested in the (one or three) real roots, then this can be solved analytically, e.g.

<http://idlastro.gsfc.nasa.gov/ftp/contrib/freudenreich/cuberoot.pro>

```
IDL> print, (cuberoot([-8,0,0,1]))(0)
2.0000000
```

If you don't have any type of polynomial, but you know that a real root

exists, then you can also find the zero using `zbrent.pro` in <http://idlastro.gsfc.nasa.gov/ftp/pro/math/zbrent.pro> to find the root numerically to within a specified tolerance.

--Wayne

Subject: Re: Better Root Finder
Posted by [mmeron](#) on Mon, 16 Apr 2007 19:17:28 GMT
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In article <31zUh.663\$0S1.610@trnddc01>, "Wayne Landsman" <wlandsman@jhu.edu> writes:

>
> <jschwab@gmail.com> wrote in message
> news:1176669683.157908.311410@b75g2000hsg.googlegroups.com...
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> numerically to within a specified tolerance.
>

Or, if you think you may have more than one real root, you can use my
`ROOT` routine and try to get them all.

Mati Meron | "When you argue with a fool,
meron@cars.uchicago.edu | chances are he is doing just the same"
