
Subject: roots of polynomial on a 2d grid
Posted by [brooker](#) on Fri, 22 Dec 1995 08:00:00 GMT
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folks,

I have a polynomial function of the form

$$f(u) = c_0 + c_1*u + c_2*u^2 + c_3*u^3$$

and I want to find all the roots of the polynomial. By the roots of the polynomial I mean the values of u such that $f(u)=0$. To do this one usually makes an array `coefs=[c_0,c_1,c_2,c_3]` and the call

```
roots=nr_zroots(coefs)
```

All the roots are then stored in the array `roots`.

This is all fine but ...

Suppose that instead of just one set of coefficients you have an array of sets of coefficients. For example consider

```
c_0=[0,1,3,4]
c_1=[2,2,2,2]
c_2=[4,3,2,1]
c_3=[3,3,4,4]
```

In order to find the roots must you use a FOR loop like

```
roots=fltarr(3,4)
for i=0,3 do begin
  coefs=[c_0(i),c_1(i),c_2(i),c_3(i)]
  roots(*,i)=nr_zroots(coefs)
endfor
```

Is there any way to find the roots without having to use the for loop??

sorry for the long winded question,

peter brooker
