
Subject: Recursive Function Program in IDL
Posted by [David Fanning](#) on Wed, 14 Dec 2005 16:02:17 GMT
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Folks,

Does anyone have a handy recursive function that does something neat?
Someone is asking, and I don't have time to work on this. He
(apparently) can't get to the newsgroup.

Thanks,

David

--

David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Subject: Re: Recursive Function Program in IDL
Posted by [b_gom](#) on Wed, 14 Dec 2005 19:43:35 GMT
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David Fanning wrote:

> Does anyone have a handy recursive function that does something neat?
> Someone is asking, and I don't have time to work on this.

Here is a recursive algorithm for simplifying polyline vertices. See
'poly_simplify.pro' in the IDL user contributed library.
<http://www.rsinc.com/codebank/search.asp?FID=307>

Brad

```
.*****  
,  
pro simplifyDP,tol,vertices,j,k,mk  
; This is the Douglas-Peucker recursive simplification routine  
; It just marks vertices that are part of the simplified polyline  
; for approximating the polyline subchain vertices[j] to vertices[k].  
; Input: tol = approximation tolerance  
; vertices[] = polyline array of vertex points  
; j,k = indices for the subchain vertices[j] to vertices[k]  
; Output: mk[] = array of markers matching vertex array vertices[]  
  
if (k le j+1) then return ; there is nothing to simplify  
  
; check for adequate approximation by segment S from vertices[j] to  
vertices[k]
```

```

maxi = j ; index of vertex farthest from S
maxd2 = 0. ; distance squared of farthest vertex
S = [[vertices[*],j], [vertices[*],k]] ; segment from vertices[j] to
vertices[k]
u = S[*],1]-S[*],0] ; segment direction vector
cu = ps_dot(u,u); segment length squared

;test each vertex vertices[i] for max distance from S
;compute using the Feb 2001 Algorithm's dist_Point_to_Segment()
;Note: this works in any dimension (2D, 3D, ...)

;Pb = base of perpendicular from vertices[i] to S
;dv2 = distance vertices[i] to S squared

for i=j+1,k-1 do begin
;compute distance squared
w = vertices[*],i] - S[*],0]
cw = ps_dot(w,u)
if cw le 0 then begin
dv2 = ps_d2(vertices[*],i], S[*],0]);
endif else begin
if cu le cw then begin
dv2 = ps_d2(vertices[*],i], S[*],1])
endif else begin
b = cw / cu;
Pb = S[*],0] + b * u;
dv2 = ps_d2(vertices[*],i], Pb);
endelse
endelse
;test with current max distance squared
if dv2 le maxd2 then continue
;vertices[i] is a new max vertex
maxi = i
maxd2 = dv2
endfor

if (maxd2 gt tol^2) then begin ;// error is worse than the tolerance
; split the polyline at the farthest vertex from S
mk[maxi] = 1 ; mark vertices[maxi] for the simplified polyline
; recursively simplify the two subpolylines at vertices[*],maxi]
simplifyDP, tol, vertices, j, maxi, mk ; // polyline vertices[j] to
vertices[maxi]
simplifyDP, tol, vertices, maxi, k, mk ; // polyline vertices[maxi]
to vertices[k]
endif
; else the approximation is OK, so ignore intermediate vertices
return
end

```

Subject: Re: Recursive Function Program in IDL
Posted by [JD Smith](#) on Wed, 14 Dec 2005 21:06:08 GMT
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On Wed, 14 Dec 2005 09:02:17 -0700, David Fanning wrote:

> Folks,
>
> Does anyone have a handy recursive function that does something neat?
> Someone is asking, and I don't have time to work on this. He (apparently)
> can't get to the newsgroup.

How about one to get all the widget ID's on a given widget tree:

```
;; descend heirarchy of tlb .. return entire tree's widget_ids in 'list'
pro treedesc, curin, list
  cur=curin ;ensure local copy of current widget
  if cur ne 0 then begin
    if n_elements(list) eq 0 then list=cur else list=[list,cur]
    cur=widget_info(cur,/CHILD) ;descend one level
    while cur ne 0 do begin ; find siblings... descend their subtrees
      treedesc,cur,list ; recurs on sibling
      cur=widget_info(cur,/SIBLING)
    endwhile
  endif
end
```

I think Mark rewrote this and stuck it in his library too.

JD

Subject: Re: Recursive Function Program in IDL
Posted by peter.albert@gmx.de on Thu, 15 Dec 2005 07:53:42 GMT
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Here is my recursive treasure: interpolate_n, extending IDL's INTERPOLATE routine to up to 8 dimensions. I have to admit that it has been years since I wrote it and I am not completely sure any more how the routine actually works, but it still seems to give the right results ... :-). The recursive part is about getting the neighbouring values for each dimension, I guess.

http://wew.met.fu-berlin.de/idl/interpolate_n.pro

Cheers,

Peter

Subject: Re: Recursive Function Program in IDL
Posted by [David Fanning](#) on Thu, 15 Dec 2005 08:36:20 GMT
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Peter Albert writes:

> Here is my recursive treasure: interpolate_n, extending IDL's
> INTERPOLATE routine to up to 8 dimensions. I have to admit that it has
> been years since I wrote it and I am not completely sure any more how
> the routine actually works, but it still seems to give the right
> results ... :-) The recursive part is about getting the neighbouring
> values for each dimension, I guess.
>
> http://www.met.fu-berlin.de/idl/interpolate_n.pro

Uh, sorry. I wasn't clear. I was looking for simple examples
I could understand. :-)

Cheers,

David

P.S. It does qualify as "neat", though. I always love programs
(I have a few myself) that you can never understand after you
write them. They are proof you are a decent programmer. Or,
I guess, used to be. :-)

--

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Subject: Re: Recursive Function Program in IDL
Posted by peter.albert@gmx.de on Thu, 15 Dec 2005 09:06:47 GMT
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Oh, well, it is just a good reason for "crossing their eyes
and sticking their tongues out the corner of their mouths" when
reading, isn't it ? :-)

Ah, uhm, well, now I see, you wanted examples for *preventing* this,
didn't you? :-)

Cheers,

Peter
