Subject: Pair Counts in an Annulus, for large data sets
Posted by fatcat3131 on Sat, 11 Nov 2006 05:52:55 GMT
View Forum Message <> Reply to Message

Hi There

I have a large data set (~350,000 galaxies) of x,y points. For a given radius R [R=sqrt(x^2+y^2)], I need to count the total number of pairs in the annulus R+deltaR. That is, I choose a given data point as my center, then count the number of points that lie inside that annulus. I then do this for each of my data points to get the total number of pairs. A simplified version of the code I'm using now is as follows:

```
****************
n = n_elements(x) ; number of data points
seperation = fltarr(n) ; the seperation between data points

for i=0L,n-1 do begin
  seperation = sqrt((x - x[i])^2 + (y - y[i])^2) ;distance between the
two points, centering on point "i"
  seperation[i] = 999 ;simply because I don't want it to count itself
as a pair

  if_inside = ((seperation gt (r)) and (seperation lt (r + deltar_r))
;has value "1" for points which lie inside, "0" for those outside
  counter = counter + total(if_sep) ;count up the number of pairs
endfor

num_pairs = counter / 2 ; since I don't want to count everything twice
****************
```

I've tried my best to avoid the urge to put lots of for loops everywhere (you should have seen it before!), but I just don't know how to make it drastically more efficient. There must be a way though, because the computations for my code are just ridiculous.... Is there a way to eliminate that nasty loop I have, which would help things?

Any help you can give would be greatly appreciated. I'm very new to IDL, as you surely know. I'm and undergrad, too.

Tara.