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Subject: matching lists

Posted by [Mark Fardal](#) on Fri, 10 Mar 2000 08:00:00 GMT

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Hi,

I have been looking at properties of particles in a simulation, and sometimes need to match up the particles in two different subsets. I typically have (quantity A, index #) for one set of particles, and (quantity B, index #) for another set, and want to compare quantities A and B for the particles that are in both sets.

As of late last night I could not think of a good way to do this; WHERE inside a for-loop would be very slow. Maybe I'm missing something easy, but in any case here's a solution inspired by the recently submitted SETINTERSECTION function. Hope somebody finds it useful.

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;+
; NAME:
;   LISTMATCH
;
; PURPOSE:
;   find the indices where a matches b
;   works only for SETS OF UNIQUE INTEGERS, e.g., array indices
;
;   for example: suppose you have a list of people with their ages and
;   social security numbers (AGE, AGE_SS), and a partially overlapping
;   list of people with their incomes and s.s. numbers (INCOME,
;   INCOME_SS). And you want to correlate ages with incomes in the
;   overlapping subset. Call
;   LISTMATCH, AGE_SS, INCOME_SS, AGE_IND, INCOME_IND
;   then AGE[AGE_IND] and INCOME[INCOME_IND] will be the desired
;   pair of variables.
;
; AUTHOR:
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;
; CALLING SEQUENCE:
;   LISTMATCH, a, b, a_ind, b_ind
;
; INPUTS:
;   a and b are sets of unique integers (no duplicate elements)
```

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;
;
; OUTPUTS:
; a_ind, b_ind are the indices indicating which elements of a and b
; are in common
;
;
; RESTRICTIONS:
; if the indices are not unique some matching elements may be skipped...
; or is it worse than that?
; EXAMPLE:
; a = [2,4,6,8]
; b = [6,1,3,2]
; listmatch, a, b, a_ind, b_ind
; print, a[a_ind]
; 2 6
; print, b[b_ind]
; 2 6
;
;
;
; MODIFICATION HISTORY:
; none
; BUGS:
; tell me about them
; ACKNOWLEDGEMENTS:
; trivial modification of SETINTERSECTION from RSI
;
;
pro listmatch, a, b, a_ind, b_ind
minab = min(a, MAX=maxa) > min(b, MAX=maxb) ;Only need intersection of ranges
maxab = maxa < maxb
;If either set is empty, or their ranges don't intersect:
; result = NULL (which is denoted by integer = -1)
if maxab lt minab or maxab lt 0 then begin
a_ind = -1
b_ind = -1
return
endif

ha = histogram(a, MIN=minab, MAX=maxab, reverse_indices=reva)
hb = histogram(b, MIN=minab, MAX=maxab, reverse_indices=revb)

r = where((ha ne 0) and (hb ne 0), count)
if count gt 0 then begin
a_ind = reva[revb[r]]
b_ind = revb[revb[r]]
return
endif else begin
a_ind = -1
b_ind = -1
return

```

endelse

end

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