mirrorstats Group

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https://github.com/bakerjd99/jacks/blob/master/mirrorxref/MirrorXref.ijs

SHA-256: 5ebaa41e8e56b4b48810a949c85ff908400546bcc752e05bd382c20eaae47afe

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Contents

mirrorstats Overview

mirrorstats Source Code

```
NB.*mirrorstats s-- utils for querying local SmugMug mirror_db metadata.
NB.
NB. verbatim:
NB.
NB. interface word(s):
NB. ------------------------------------------------------------------------------
NB.  NotDivisible - albums with image counts that are not divisible by 3 and 5
NB.  albdist      - all mean album distances km from position (x)
NB.  fsd          - fetch sqlite dictionary array
NB.  fst          - fetch sqlite reads table
NB.  meanalbdist  - mean km distance of geotagged album images from (x)
NB.
NB. created: 2022jul07
NB. ------------------------------------------------------------------------------

require 'data/sqlite'

coclass 'mirrorstats'

NB.*dependents
NB. (*)=: AlbumImageCount_sql GeotaggedAlbumImages_sql
NB.*enddependents

NB. NOTE: the j sqlite addon is fussy about how sql is formatted.
NB. Running standard sql pretty printers or indenting sql in your
NB. favorite style is likely to produce code that doesn't work.

AlbumImageCount_sql=:  (0 : 0)
select count(1) as ImageCnt, a.AlbumKey, b.AlbumName from ImageAlbumXr a
inner join Album b on a.AlbumKey=b.AlbumKey group by a.AlbumKey
)

GeotaggedAlbumImages_sql=:  (0 : 0)
select AlbumName, OnlineImageFile, Latitude, Longitude from OnlineImage a
inner join ImageAlbumXr b on a.ImageKey = b.ImageKey
inner join Album c on b.AlbumKey = c.AlbumKey
where (not (a.Latitude = 0 and a.Longitude = 0))
and c.AlbumName like
)


NB.*end-header

ALTMIRRORDBPATH=: 'c:/SmugMirror/Documents/XrefDb/'

NB. interface words (IFACEWORDSmirrorstats) group
IFACEWORDSmirrorstats=: <;._1 ' NotDivisible albdist fsd fst meanalbdist'

NB. sqlite mirror database file name
MIRRORDB=: 'mirror.db'
```

```
NB. mirror database path
MIRRORDBPATH=: 'c:/smugmirror/documents/xrefdb/'

NB. home longitude and latitude, west longitudes +, north latitudes +
MeeusHomeLonLat=: 0 0

NB. root words (ROOTWORDSmirrorstats) group
ROOTWORDSmirrorstats=: <;._1 ' IFACEWORDSmirrorstats NotDivisible ROOTWORDSmirrorstats VMDmirrorstats albdi
>..>st albextent dstat freq fsd fst histogram2 itYMDhms ofreq portchars read'


NB. version, make count and date
VMDmirrorstats=: '0.5.0';10;'10 Jul 2022 10:52:24'

AlbumImageCount=: 3 : 0

NB.*AlbumImageCount v-- execute (AlbumImageCount_sql) query.
NB.
NB. monad:  bt =. AlbumImageCount clMirrorDb
NB.
NB.   AlbumImageCount ALTMIRRORDBPATH,MIRRORDB

NB. get album image counts and names
AlbumImageCount_sql fsd y
)
```

```
NotDivisible=: 3 : 0

NB.*NotDivisible  v--  albums with  image  counts  that  are  not
NB. divisible by 3 and 5.
NB.
NB. This  verb  finds  albums  with  image  counts that  are  not
NB. divisibe by  3 and 5. This weird requirement was motivated by
NB. how the SmugMug iPhone App displays galleries. It breaks  the
NB. images into rows  of three or five. I  don't  like incomplete
NB. terminal rows.
NB.
NB. monad:  bt =. NotDivisible clMirrorDb
NB.
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB.   NotDivisible trg
NB.
NB. dyad:   bt =. ia NotDivisible clMirrorDb
NB.
NB.   4 NotDivisible trg

3 5 NotDivisible y
:
NB. !(*)=. ImageCnt AlbumName
(0 {"1 d)=. 1 {"1 d=. AlbumImageCount y

NB. works for integer (x) without common divisors
'common factor(s)' assert -.pwcf x
```

```
a=. x , */x

b=. */ 0 < r=. a |"0 1 ImageCnt
c=. (a *"1 >. ImageCnt %"0 1 a) - ImageCnt
c=. (/: |."1 b # c) { (<"0 b # ImageCnt,.c) ,. b # AlbumName
c ,~ '[Count]';(<"0 a),<'[Album Name]'
)

albdist=: 3 : 0

NB.*albdist v-- all mean album distances km from position (x).
NB.
NB. monad:  bt =. albdist uuIgnore
NB.
NB.   albdist 0
NB.
NB. dyad:  bt =. flLonLat albdist uuIgnore
NB.
NB.   0 0 albdist 0  NB. distances km from lb origin

MeeusHomeLonLat albdist 0
:
a=. nonemptyalbums 0
d=. x&meanalbdist&> 1 {"1 a
((<"0 b#d) ,. b # 1 {"1 a) [ b=. 0 < d
)

NB. mean km distance of geotagged album images from album "centroid"
albextent=: meanalblonlat meanalbdist ]

antimode=: 3 : 0

NB.*antimode v-- finds the least frequently occurring  item(s) in
NB. a list.
NB.
NB. monad:  ul =. antimode ul
NB.
NB.   antimode ?.500#100
NB.   antimode ;:'blah blah blah yada yada wisdom'


if. 0 < # y =. ,y do.    NB. no antimodes for null lists
  f =. #/.~ y            NB. nub frequency
  (~. y) #~ f e. <./ f   NB. lowest frequency items
else. y
end.
)

NB. arc tangent
arctan=: _3&o.

NB. signal with optional message
assert=: 0 0"_ $ 13!:8^:((0: e. ])`(12"_))

NB. retains string before first occurrence of (x)
beforestr=: ] {.~ 1&(i.~)@([ E. ])
```

```
charsub=: 4 : 0

NB.*charsub v-- single character pair replacements.
NB.
NB. dyad:  clPairs charsub cu
NB.
NB.   '-_$ ' charsub '$123 -456 -789'

'f t'=. ((#x)$0 1)<@,&a./.x
t {~ f i. y
)

NB. cosine radians
cos=: 2&o.

NB. double quotes - doubles internal " quotes like (quote)
dbquote=: '"'&,@(,&'"')@(#~ >:@(=&'"'))

NB. deviation about mean
dev=: -"_1 _ mean

dstat=: 3 : 0

NB.*dstat v-- descriptive statistics
NB.
NB. monad: ct =. dstal nl
NB.
NB.   dstat  ?.1000#100
NB.
NB. dyad:  ct =.  faRound dstat nl
NB.
NB.   0.1 dstat  ?.1000#100

0.0001 dstat y
:
t=. '/sample size/minimum/maximum/1st quartile/2nd quartile/3rd quartile/first mode'
t=. t , '/first antimode/mean/std devn/skewness/kurtosis'
min=. <./
max=. >./
t=. ,&':  ' ;._1 t
v=. $,min,max,q1,median,q3,({.@mode2),({.@antimode),mean,stddev,skewness,kurtosis
t,. ": x round ,. v , y
)

earthdist=: 4 : 0

NB.*earthdist v-- distance in km between n points on the Earth's surface.
NB.
NB. dyad:  (fl | ft) earthdist (fl | ft)
NB.
NB.   NB. Paris longitude, latitude
NB.   NB. ddfrdms computes decimal degrees from degree, minutes, seconds
NB.   l1     =. ddfrdms _2 _20 _14    NB.  2d 20m 14s (East)
NB.   theta1 =. ddfrdms 48 50 11      NB. 48d 40m 11s (North)
NB.
NB.   NB. Washington
NB.   l2     =. ddfrdms 77 3 56       NB. 77d  3m 56s (West)
NB.   theta2 =. ddfrdms 38 55 17      NB. 38d 55m 17s (North)
NB.
NB.   NB. rounded to 2 decimals matches Meeus
NB.   6181.63 = ". '0.2' 8!:2 (l1,theta1) earthdist l2,theta2
NB.
NB.   NB. table arguments
NB.   (|: 5 # ,: l1,theta1) earthdist |: 5 # ,: l2,theta2

a=.  6378.14      NB. Earth's mean radius (km)
fl=. % 298.257    NB. Earth's flattening (a * 1 - fl) is polar radius

NB. zero distances mask
b=.  *./ x = y

NB. longitudes and latitudes in decimal degrees
NB. western longitudes +, northern latitudes +
NB. (*)=. l1 l2 theta1 theta2
'l1 theta1'=.  x [ 'l2 theta2'=. y

f=.      rfd -: theta1 + theta2
g=.      rfd -: theta1 - theta2
lambda=. rfd -: l1 - l2

sqrsin=. *: @ sin
sqrcos=. *: @ cos
```

```
sinlam=.  sqrsin lambda [ coslam=. sqrcos lambda
sqrcosg=. sqrcos g [ sqrsing=. sqrsin g
sqrsinf=. sqrsin f [ sqrcosf=. sqrcos f

s=. (coslam * sqrsing) + sinlam * sqrcosf
c=. (coslam * sqrcosg) + sinlam * sqrsinf

omega=. arctan %: s % c
r3=. 3 * (%: s * c) % omega
d=.  +: omega * a
h1=. (<: r3) % +: c
h2=. (>: r3) % +: s

NB. required distance
d=. d * (>: fl*h1*sqrsinf*sqrcosg) - fl*h2*sqrcosf*sqrsing

NB. handle any zero distances
if. +./ b do.
  NB. cannot do b*d as d is undefined _. for zero distances
  if. #$ d do. 0 (I. b)} d elseif. b do. 0 elseif. 1 do. d end.
else.
  d
end.
)

NB. frequency distribution
freq=: ~. ; #/.~
```

```
fsd=: 4 : 0

NB.*fsd v-- fetch sqlite dictionary array.
NB.
NB. dyad:  clSql fsd clDb
NB.
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB.   sql=. 'select ImageKey, OriginalWidth, OriginalHeight, OnlineImageFile, Keywords from OnlineImage'
NB.   sql fsd trg

NB. require 'data/sqlite' !(*)=. sqlclose__db sqldict__db sqlopen_psqlite_
d [ sqlclose__db '' [ d=. sqldict__db x [ db=. sqlopen_psqlite_ y
)

fst=: 4 : 0

NB.*fst v-- fetch sqlite reads table.
NB.
NB. dyad:  bt =. clSql fst clDb
NB.
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB.   sql=. 'select ImageKey, OriginalWidth, OriginalHeight, OnlineImageFile, Keywords from OnlineImage'
NB.   sql fst trg

NB. require 'data/sqlite' !(*)=. sqlclose__db sqlreads__db sqlopen_psqlite_
d [ sqlclose__db '' [ d=. sqlreads__db x [ db=. sqlopen_psqlite_ y
)
```

```
NB. variation on (histogram) uses left open intervals (xi, xi+1]
histogram2=: <:@(#/.~)@(i.@>:@#@[ , |.@[ (#@[ - I.) ])

NB. sqlite iso character timestamps to Y M D h m s table - ignores timezones
itYMDhms=: [: _1&".&> '- T : '&charsub@('+'&beforestr)&.>

NB. kurtosis
kurtosis=: # * +/@(^&4)@dev % *:@ssdev

NB. mean value of a list
mean=: +/ % #

meanalbdist=: 3 : 0

NB.*meanalbdist v-- mean km  distance  of geotagged album  images
NB. from (x).
NB.
NB. monad:  fa =. meanalbdist clAlbumName
NB.
NB.   meanalbdist 'Weekenders'    NB. has geotagged images
NB.   meanalbdist 'Alpha Layered' NB. no geotagged images - 0 result
NB.
NB. dyad: fa =. flLonLat meanalbdist clAlbumName
NB.
NB.   NB. mean distance from lb origin off west Africa
NB.   0 0 meanalbdist 'Ghana 1970''s'
```

```
MeeusHomeLonLat meanalbdist y
:
db=. ALTMIRRORDBPATH mirrorcn 0
(;0{r)=. ;1{r=. sqlread__db GeotaggedAlbumImages_sql,' ' ,dbquote y
NB. !(*)=. Longitude Latitude
if. #Longitude do. mean x earthdist (-Longitude) ,: Latitude else. 0 end.
)

meanalblonlat=: 3 : 0

NB.*meanalblonlat v-- mean longitude and latitude of geotagged
NB. album images.
NB.
NB. The point computed is roughly the "centroid" of geotagged
NB. album images. Uses Meeus conventions: western longitudes +,
NB. northern latitudes +.
NB.
NB. monad: meanalblonlat clAlbumName

db=. ALTMIRRORDBPATH mirrorcn 0
(;0{r)=. ;1{r=. sqlread__db GeotaggedAlbumImages_sql,' ' ,dbquote y
NB. !(*)=. Longitude Latitude
if. #Longitude do. mean"1 (-Longitude) ,: Latitude else. 0 0 end.
)

NB. median value of a list
median=: -:@(+/)@((<. , >.)@midpt { /:~) ::_:
```

```
NB. mid-point
midpt=: -:@<:@#

mirrorcn=: 3 : 0

NB.*mirrorcn v-- connect to mirror database.
NB.
NB. monad:  ba =. mirrorcn uuIgnore

MIRRORDBPATH mirrorcn 0
:
NB. require 'data/sqlite' !(*)=. sqlopen_psqlite_
sqlopen_psqlite_ x,MIRRORDB
)

mode2=: 3 : 0

NB.*mode2 v-- finds  the  most frequently occurring item(s) in  a
NB. list.
NB.
NB. monad:  ul =. mode2 ul
NB.
NB.   mode2 ?.500#100
NB.   mode2 ;:'I do what I do because I am what I am'

if. 0 < # y =. ,y do.     NB. null lists have no modes
  f =. #/.~ y             NB. nub frequency
  (~. y) #~ f e. >./ f    NB. highest frequency items
else. y
end.
)

nonemptyalbums=: 3 : 0

NB.*nonemptyalbums v-- nonempty albums.
NB.
NB. monad:  bt =. nonemptyalbums uuIgnore

db=. ALTMIRRORDBPATH mirrorcn 0
(;0{r)=. ;1{r=. sqlread__db AlbumImageCount_sql
NB. !(*)=. ImageCnt AlbumName
(<"0 b#ImageCnt) ,. b#AlbumName [ b=. 0 < ImageCnt
)

NB. like (freq) but results in descending frequency
ofreq=: [: (([: < [: \: [: ; 1 {  ]) { &.> ]) ~. ; #/.~

NB. portable box drawing characters
portchars=: [: 9!:7 '+++++++++|-'"_ [ ]

NB. 1 if (x) has at least one pair with common factor(s) - see long document
pwcf=: 1 < [: >./ [: +/ [: +./@e.&>/~ 0 -.&.>~ [: <"1 [: ~."1 q:

NB. first quartile
q1=: median@((median > ]) # ]) ::_:
```

```
NB. third quartile
q3=: median@((median < ]) # ]) ::_:

NB. reads a file as a list of bytes
read=: 1!:1&(]`<@.(32&>@(3!:0)))

NB. radians from degrees
rfd=: *&0.0174532925199432955

NB. round (y) to nearest (x) (e.g. 1000 round 12345)
round=: [ * [: (<.) 0.5 + %~

NB. sine radians
sin=: 1&o.

NB. skewness
skewness=: %:@# * +/@(^&3)@dev % ^&1.5@ssdev

NB. sum of square deviations (2)
ssdev=: +/@:*:@dev

NB. standard deviation (alternate spelling)
stddev=: %:@:var

NB. var
var=: ssdev % <:@#
```

```
NB.POST_mirrorstats post processor.

smoutput IFACE=:  (0 : 0)
NB. (mirrorstats) interface word(s): 20220710j105224
NB. -------------------------------
NB. NotDivisible  NB. albums with image counts that are not divisible by 3 and 5
NB. albdist       NB. all mean album distances km from position (x)
NB. fsd           NB. fetch sqlite dictionary array
NB. fst           NB. fetch sqlite reads table
NB. meanalbdist   NB. mean km distance of geotagged album images from (x)
)

cocurrent 'base'
coinsert  'mirrorstats'
```

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