

# MirrorXref Group

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

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## MirrorXref Overview

**MirrorXref** is a J script that scans the directories written by the Python [smugpyter](#) program and builds a new compact version of the [SQLite](#) cross reference image metadata database [mirror.db](#)

[mirror.db](#) cross references local image files with online versions on my [SmugMug image site](#). Local images are catalogued in [ThumbsPlus](#) SQLite databases. [mirror.db](#) matches local ThumbsPlus image and path keys with online keys.

## MirrorXref Interface

<a href="#">BuildMirror</a>	<a href="#">[20]</a>	<i>backup/create/load mirror</i>
<a href="#">CheckRealDates</a>	<a href="#">[22]</a>	<i>check real dates</i>
<a href="#">DumpLocalImageNatural</a>	<a href="#">[25]</a>	<i>dump (LocalImage) as TAB delimited text</i>
<a href="#">LocalFromDir</a>	<a href="#">[38]</a>	<i>local files with directory match (y) and file match (x)</i>
<a href="#">MirrorStatReport</a>	<a href="#">[50]</a>	<i>mirror database upload summary report</i>
<a href="#">MissingImagesReport</a>	<a href="#">[51]</a>	<i>missing local images report</i>
<a href="#">SetBogusRealDates</a>	<a href="#">[54]</a>	<i>set bogus real dates in one real dates file</i>
<a href="#">SuspiciousPairReport</a>	<a href="#">[56]</a>	<i>suspicious local and online file pairings</i>

## Using MirrorXref

**MirrorXref** is the tail that wags my image metadata dog. I have been uploading digital images to [Flickr](#) and then [SmugMug](#) since the early 2000s. At first my captions were short and sweet but eventually I stared *milliblogging*. To capture and archive my milliblogs I wrote a Python program [SmugPyter](#) that extracts metadata from SmugMug, see: [Downloading SmugMug Captions with Python and Jupyter](#).

**SmugPyter** is a total kludge with a long history of struggling with the not entirely dependable SmugMug web API. About the only feature of **SmugPyter** that has proven its mettle is its mirror staging directories. I write metadata collected from SmugMug to directories that mirror the structure of online galleries and albums on SmugMug. Metadata is written to simple text files that **MirrorXref** consolidates into a single SQLite database file. I chose this elaborate staging “design” to make it easy to use metadata in other contexts and to allow maximum flexibility for working around future problems. My recent changes (June 2022) to **MirrorXref** exploit the staging directories to patch another SmugMug API *problem*.

The processing of metadata was always irritating but working around SmugMug API failures has made it complex enough to actually document. Here’s what I do to prepare data for the final `mirror.db` build.

1. Upload new images to SmugMug.
2. Run the batch files in `C:\mp\jupyter\smugpyter\notebooks` in this order

```
RefreshRecentMetadata.bat  
UpdateSampleImages.bat  
UpdateSmugKeywords.bat
```

3. `UpdateSmugKeywords.bat` writes `C:\SmugMirror\Mirror\AllChanges.txt`. This text file holds the computed dominant color and image size keys of the images uploaded in step 1: see [Setting SmugMug Print Size and Geotag Keywords with Jupyter and Python](#) and [Finding Dominant Color Names from Color Space Coordinates and Images](#). In earlier versions of **SmugPyter** these keys were directly posted to **SmugMug** but the API calls doing this stopped working years ago. I tried to fix the API calls but gave up and opted for manual keyword updates. I seldom upload more than twenty images in a batch so manual updates is merely annoying — not crippling.
4. Cut and paste the keywords in `C:\SmugMirror\Mirror\AllChanges.txt` to corresponding SmugMug images. I do this in a browser.
5. Run the batch file `RefreshRecentMetadata.bat` again to pick up the manual changes of step 4.

6. Mount one of my offline USB picture drives and sync the image and mirror directory changes. This step copies new images and metadata to offline drives.
7. Update my primary thumbnail database by scanning offline directories with **ThumbsPlus**.
8. Load **MirrorXref** in a J session and run **BuildMirror 2**. This creates a temporary **mirror\_temp.db** that may contain bogus 9999-01-01T00:00:00 dates. The Python function that fetched real image dates from SmugMug stopped working in May 2022 so I am now collecting these dates from the offline database. The pairing of online and offline images creates forward references that are resolved in the next step.
9. In the J session of step 8. run **SetBogusRealDates**&.> 0 {"1 CheckRealDates '/real\*.txt' This creates real date \*.fix files in mirror directories that have bogus dates. The fix files are copies of real date files with the bogus dates replaced by dates pulled from the local primary database.
10. Replace the real date files with the fix files by changing the file extension to **txt**.
11. Run the batch file **C:\SmugMirror\Documents\XrefDb\buildmirror.bat**. This batch file backs up existing **mirror.db** files and creates a new one by scanning all the metadata text files in the mirror staging directories.

Of course all of this could be streamlined but it would require a complete reworking of more code than I care to hack. The final **mirror.db** contains all the metadata I care about in a highly portable format.

## **MirrorXref Schema**

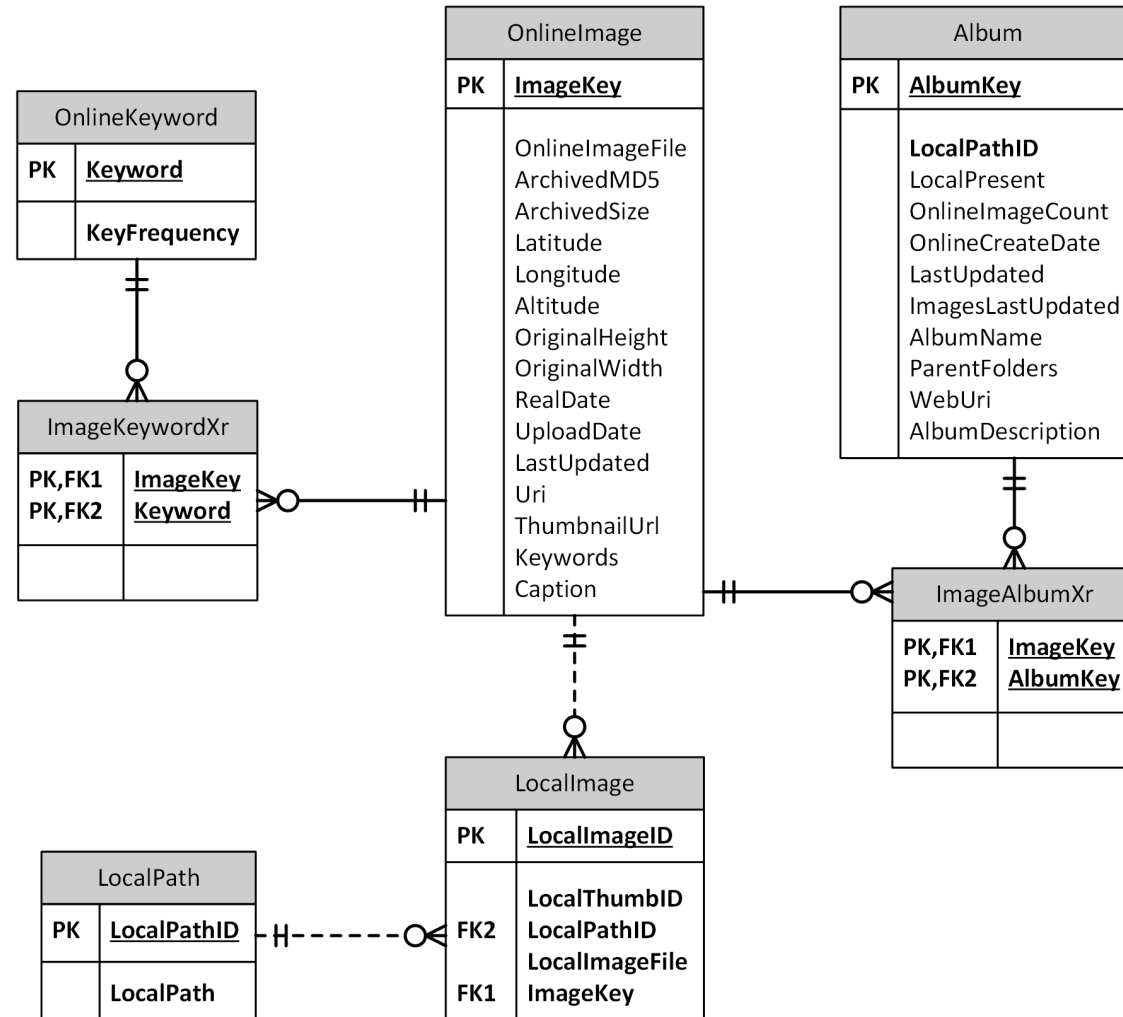


Figure 1: mirror.db schema.

## MirrorXref Source Code

```
NB.*MirrorXref s-- create and load sqlite mirror cross reference database.
NB.
NB. This script scans the files in the (SmugMirror) directories that
NB. were written by the Python (smugpyter) scripts and builds a single
NB. compact SQLite image and album metadata database (mirror.db).
NB.
NB. (mirror.db) cross references local image files with online versions
NB. on my SmugMug image site.
NB.
NB. verbatim:
NB.
NB. https://conceptcontrol.smugmug.com/
NB. https://github.com/bakerjd99/smugpyter
NB.
NB. interface word(s):
NB. -----
NB. BogusRealDates      - images from single real date file with bogus dates
NB. BuildMirror         - backup/create/load mirror
NB. CheckRealDates      - check real dates
NB. DumpLocalImageNatural - dump (LocalImage) as TAB delimited text
NB. LocalFromDir        - local files with directory match (y) and file match (x)
NB. MirrorStatReport    - mirror database upload summary report
NB. MissingImagesReport - missing local images report
NB. SuspiciousPairReport - suspicious local and online file pairings
```

NB.  
NB. *created: 2018jun06*  
NB. -----  
NB. *18jun06 group class created*  
NB. *18jun23 main (BuildMirror) added*  
NB. *18jun26 schema finalized and (DumpLocalImageNatural) added*  
NB. *18jul10 (MissingLocalFiles\_sql) added*  
NB. *18jul12 (MatchOnlineNoBrackets) added*  
NB. *18jul17 (MissingImagesReport) added*  
NB. *18dec01 (ParentFolders, ImagesLastUpdated, OnlineImageCount, WebUri) added to (Album) table*  
NB. *18dec04 (OnlineCreateDate) added to (Album) table*  
NB. *19feb19 (SuspiciousPairReport) added*  
NB. *19apr08 display J version - J 9.01 has incompatible language changes*  
NB. *19aug16 upload summary rate report code added*  
NB. *19oct03 added (Divisible)*  
NB. *20nov03 fix typos (Album, LocalImage) foreign keys*  
NB. *20nov21 add (UnClickHereImages\_sql)*  
NB. *22may27 added (CheckRealDates)*  
NB. *22may29 added (BogusRealDates)*  
NB. *22jun04 modified (BuildMirror) to build mirror\_temb.db*

`require 'data/sqlite'`

`coclass 'MirrorXref'`

*NB.\*dependents*

*NB. (\*)=: CreateMirror\_sql LocalFile\_sql UpdateLocalPresent\_sql LocalOnlineFile\_sql*

*NB. (\*)=: MissingLocalFiles\_sql UnClickHereImages\_sql  
NB.\*enddependents*

*NB. schema of mirror.db database - parsed on ';' character*

```
CreateMirror_sql=: (0 : 0)
create table LocalPath
  (LocalPathID integer not null primary key,
   LocalPath text not null);

create table OnlineKeyword
  (Keyword text not null primary key,
   KeyFrequency integer not null);

create table Album
  (AlbumKey text not null primary key,
   LocalPathID integer not null,
   LocalPresent integer check(LocalPresent==0 or LocalPresent==1),
   OnlineImageCount integer,
   OnlineCreateDate date,
   LastUpdated date,
   ImagesLastUpdated date,
   AlbumName text,
   ParentFolders text,
   WebUri text,
   AlbumDescription text,
   foreign key(LocalPathID) references LocalPath(LocalPathID));
```



```
create table OnlineImage
  (ImageKey text not null primary key,
   OnlineImageFile text,
   ArchivedMD5 text,
   ArchivedSize integer,
   Latitude float,
   Longitude float,
   Altitude integer,
   OriginalHeight integer,
   OriginalWidth integer,
   RealDate date,
   UploadDate date,
   LastUpdated date,
   Uri text,
   ThumbnailUrl text,
   Keywords text,
   Caption text);

create table ImageAlbumXr
  (ImageKey text not null,
   AlbumKey text not null,
   primary key(ImageKey, AlbumKey),
   foreign key(AlbumKey) references Album(AlbumKey),
   foreign key(ImageKey) references OnlineImage(ImageKey));

create table ImageKeywordXr
  (ImageKey text not null,
```

```
Keyword text not null,  
primary key(ImageKey, Keyword),  
foreign key(Keyword) references OnlineKeyword(Keyword),  
foreign key(ImageKey) references OnlineImage(ImageKey));  
  
create table LocalImage  
(LocalImageID integer not null primary key autoincrement,  
LocalThumbID integer not null,  
LocalPathID integer not null,  
LocalImageFile text not null,  
ImageKey text not null,  
foreign key(LocalPathID) references LocalPath(LocalPathID),  
foreign key(ImageKey) references OnlineImage(ImageKey));  
)
```

*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.*

*NB. Test your sql fragments to avoid this "tickeyboo!"*

```
LocalFile_sql=: (0 : 0)  
select  a.ImageKey, OnlineImageFile, LocalPath from OnlineImage a  
inner join ImageAlbumXr b on a.ImageKey = b.ImageKey  
inner join Album c on c.AlbumKey = b.AlbumKey  
inner join LocalPath d on d.LocalPathID = c.LocalPathID  
where c.AlbumKey = ?  
order by OnlineImageFile  
)
```

```
UpdateLocalPresent_sql=: 'update Album set LocalPresent = 1 where AlbumKey in '
```

```
LocalOnlineFile_sql=: (0 : 0)
select RealDate, c.ImageKey, LocalThumbID, b.LocalPathID, LocalPath, LocalImageFile, OnlineImageFile from
>..>LocalImage a
inner join LocalPath b on b.LocalPathID = a.LocalPathID
inner join OnlineImage c on c.ImageKey = a.ImageKey
order by RealDate
)
```

```
MissingLocalFiles_sql=: (0 : 0)
select count(1) as MissingCnt, c.AlbumName, group_concat(OnlineImageFile, '|') as NoLocalFile from OnlineI
>..>mage a
inner join ImageAlbumXr b on b.ImageKey = a.ImageKey
inner join Album c on c.AlbumKey = b.AlbumKey
where a.ImageKey not in (select ImageKey from LocalImage)
group by c.AlbumName
order by MissingCnt asc
)
```

```
UnClickHereImages_sql =: (0 : 0)
select ImageKey, OnlineImageFile, Caption from OnlineImage where Caption like "%href=%"
and ImageKey not in (select ImageKey from OnlineImage where Caption like "%(click here)%")
)
```

*NB.\*end-header*

*NB. returns image count, key and full name for albums*

```
AlbumImageCount_sql=: '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'
```

*NB. names of bad gallery count file*

```
BADGALCNTS=: 'badgalcnts.txt'
```

*NB. invald marker date for python real date failures*

```
BOGUSMARKDATE=: 9999 1 1
```

*NB. carriage return character*

```
CR=: 13{a.
```

*NB. interface words (IFACEWORDSMirrorXref) group*

```
IFACEWORDSMirrorXref=: <;._1 ' BuildMirror CheckRealDates DumpLocalImageNatural LocalFromDir MirrorStatRepo  
>..>rt MissingImagesReport SetBogusRealDates SuspiciousPairReport'
```

*NB. line feed character*

```
LF=: 10{a.
```

*NB. name of missing local images file*

```
LOCOMISS=: 'locomiss.txt'
```

*NB. name of online local cross reference table*

```
LOCXREF=: 'locoxref.txt'
```

*NB. macros associated with (MACROSMirrorXref) group*

MACROSMirrorXref=: ,<'base36\_py'

*NB. name of online local manual corrections cross reference table*

MANLOCOXREF=: 'manlocoxref.txt'

*NB. sqlite mirror database file name*

MIRRORDB=: 'mirror.db'

*NB. mirror database path*

MIRRORDBPATH=: 'c:/smugmirror/documents/xrefdb/'

*NB. alternate database names - used to resolve forward references*

MIRRORDBTEMP=: 'mirror\_temp.db'

*NB. head of path - change for os*

MIRRORHEAD=: 'c:/'

*NB. mirror directory root path*

MIRRORPATH=: 'c:/smugmirror/mirror'

*NB. version, make count and date*

MIRRORVMD=: '0.9.75';79;'14 Jul 2022 09:39:13'

*NB. primary SQLite ThumbsPlus test database - copy of primary database*

PRIMARYTEST=: 'c:/thumbsdbs/primarytest.tpdb8s'

*NB. fully qualified sqlite primary thumbs database file name*

```
PRIMARYTHUMBS=: 'c:/thumbsdbs/primary2018.tpdb8s'
```

*NB. root words (ROOTWORDSMirrorXref) group*

```
ROOTWORDSMirrorXref=: <;._1 ' BogusRealDates BuildMirror Divisible IFACEWORDSMirrorXref LocalFromDir MACROS  
>..>MirrorXref MIRRORVMD ROOTWORDSMirrorXref UnClickHereImages_sql'
```

*NB. name of suspect image pairs report*

```
SUSPECTPAIRS=: 'suspects.txt'
```

*NB. name of upload rate summary file*

```
UPRATESUM=: 'upratesum.txt'
```

*NB. image counts for given year {{date}} is placeholder*

```
UploadRateCount_sql=: 'select count(1) as ImageCnt, strftime("%Y", {{date}}) as Year from OnlineImage group  
>..> by strftime("%Y", {{date}}) order by strftime("%Y", {{date}})'
```

```
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
)
```

```
BackUpMirrorXrefDb=: 3 : 0
```

*NB.\*BackUpMirrorXrefDb v-- backup mirror database and erase if*

*NB. (x) is 1.*

*NB.*

*NB. monad: iaRc =. BackUpMirrorXrefDb (clMirrorDir ; clBackupDir)*

*NB.*

*NB. mrd=. 'c:/smugmirror/documents/xrefdb/' NB. mirror ddirectory*

*NB. bak=. 'c:/smugmirror/documents/xrefdb/backup/' NB. mirror backup directory*

*NB. BackUpMirrorXrefDb mrd;bak*

*NB.*

*NB. dyad: iaRc =. paClearDb BackUpMirrorXrefDb (clMirrorDir ; clBackupDir)*

```
1 BackUpMirrorXrefDb y
```

```
:
```

```
'source target'=. tslash2&.> y
```

```
'tdate ttime'=. yyymondd 0
```

```
bakpfx=. target,tdate,'-00-'
```

```
rc=. 0 NB. assume failure
```

```
try.
```

```
if. -.fexist source,MIRRORDB do.
```

```
1 [ smoutput MIRRORDB,' database missing - continue build' return.
end.

if. x -: 1 do.

  NB. read (MIRRORDB) bytes - this copy method
  NB. works well for files < 200MB and (MIRRORDB)
  NB. will remain well below that threshold.
  bindb=. read source,MIRRORDB
  txtxf=. mantxf=. sustxf=. badtxtf=. uprtxf=. ''
  if. fexist source,LOCOXREF      do. txtxf=. read source,LOCOXREF end.
  if. fexist source,MANLOCOXREF  do. mantxf=. read source,MANLOCOXREF end.
  if. fexist source,SUSPECTPAIRS do. sustxf=. read source,SUSPECTPAIRS end.
  if. fexist source,BADGALCNTS   do. badtxtf=. read source,BADGALCNTS end.
  if. fexist source,UPRATESUM    do. uprtxf=. read source,UPRATESUM end.
  if. 1e6 > #bindb do.
    rc [ smoutput MIRRORDB,' to small' return.
  end.

  NB. get today's backup files !(*)=. dir
  if. #files=. \:~ 1 dir target,tdate,'*.db' do.
    NB. increment day backup - allow 100 per day
    bcnt=. _1&". _2 {. '-&beforelaststr ;0{files
    if. (bcnt < 0) +. 100 <: bcnt do.
      rc [ smoutput 'backup count invalid' return.
    end.
    bcnt=. , 'r<0>2.0' (8!:2) >:bcnt
```



```
    bakpfx=. target,tdate,'-',bcnt,'-'
end.

smoutput 'backing up -> ',bakpfx,MIRRORDB
bindb write bakpfx,MIRRORDB
txtxf write bakpfx,LOCOXREF
mantxtf write bakpfx,MANLOCOXREF
sustxtf write bakpfx,SUSPECTPAIRS
badtxtf write bakpfx,BADGALCNTS
uprtxtf write bakpfx,UPRATESUM

NB. clear db source if a backup exists
if. fexist bakpfx,MIRRORDB do.
    if. 0 > ferase source,MIRRORDB do.
        rc [ smoutput 'unable to erase ',MIRRORDB return.
    end.
end.

elseif. x -: 0 do.

    smoutput 'removing ',MIRRORDB,' without backup'
    if. 0 > ferase source,MIRRORDB do.
        rc [ smoutput 'unable to erase ',MIRRORDB return.
    end.

elseif. x -: 2 do.
```

```
NB. remove any temporary forward reference db
if. 0 > ferase source,MIRRORDBTEMP do.
    rc [ smoutput 'unable to erase ',MIRRORDBTEMP return.
end.

elseif.do.

    rc [ smoutput 'invalid backup option' return.

end.

rc=. 1 NB. success
catch.
    rc=. 0
end.
rc
)

BogusRealDates=: 3 : 0

NB.*BogusRealDates v-- images from single real date file with
NB. bogus dates.
NB.
NB. monad: btcl =. BogusRealDates clFileRealDates
NB.
NB. p=. 'c:/smugmirror/mirror/Other/DirectCellUploads/'
NB. f=. p,'realdate-DirectCellUploads-RMWQ6K-1p.txt'
NB. BogusRealDates f
```

```
NB.
NB.   NB. bogus dates over many galleries
NB.   BogusRealDates@.> 0 {"1 CheckRealDates '/real*.txt'

if. 1 = #t=. readtd2 y do. (0,>:}.$t)$'' NB. only header
else.
  p=. tslash justdrvpath winpathsep y
  t=. }. t [ h=. 0{t NB. table file header
  c=. h i. <'RealDate'
  b=. (intfdate BOGUSMARKDATE) = 0&" (-.&'-' )@('T'&beforestr) &> c {"1 t
  (h,<'MirrorPath'),b#t ,. <p NB. only bogus dates
end.
)

BracketOverlaps=: 3 : 0

NB.*BracketOverlaps v-- files that have []'ed and nonbracketed versions.
NB.
NB. monad: blcl =. BracketOverlaps blObj

NB. !(*)=. name
d=. sqldict__y 'select name from Thumbnail'
(0 {"1 d)=. 1 {"1 d

NB. mask files with []'s
b=. */@('[]'&e.)&> name

NB. []'ed and nonbracketed files
```

```
fb=. justfile@alltrim@(['&beforestr)&.> b#name
fn=. justfile&.> name #~ -.b
```

```
NB. extension free names that have []'ed and nonbracketed versions
fn -. fn -. fb
)
```

```
BuildMirror=: 3 : 0
```

```
NB.*BuildMirror v-- backup/create/load mirror.db
NB.
```

```
NB. This verb builds a new version of the mirror.db SQLite local
NB. and online cross reference database. It is designed to run
NB. from jconsole.exe. If run from other J front ends the
NB. smoutput messages may not show until the process completes.
NB.
```

```
NB. monad: BuildMirror iaBackup
```

```
NB.
```

```
NB. BuildMirror 0 NB. skip backup and build
```

```
NB. BuildMirror 1 NB. backup and build
```

```
NB. BuildMirror 2 NB. build allowing bogus real dates
```

```
smoutput 9!:14 '' NB. display J version
```

```
sdr=. MIRRORPATH NB. mirror directory
```

```
mrd=. MIRRORDBPATH NB. mirror database directory
```

```
trg=. mrd,MIRRORDB NB. mirror db
```

*NB. use another name for bogus real date forward references*

```
if. 2 -: y do. trg=. mrd,MIRRORDBTEMP end.
```

```
bak=. mrd,'backup'      NB. mirror backup directory
dmp=. mrd,LOCOXREF      NB. online local pairs
mcf=. mrd,MANLOCOXREF   NB. manual online local corrections
mli=. mrd,LOCOMISS      NB. missing local images report
ssp=. mrd,SUSPECTPAIRS  NB. suspect image pairs report
src=. PRIMARYTHUMBS     NB. thumbsplus db
urp=. mrd,UPRATESUM     NB. upload rate summary report
```

*NB. check real dates for bogus or invalid dates*

*NB. all such dates should be fixed before building*

```
if. 2 -: y do. smoutput 'build allowing bogus dates'
else.
  if. #bf=. CheckRealDates '/real*.txt' do.
    smoutput 'invalid or bogus real dates'
    smoutput 'fix dates in following files and rerun'
    smoutput bf
    return.
  end.
end.
```

```
if. y BackUpMirrorXrefDb mrd;bak do.
  smoutput LoadMirrorXrefDb sdr;src;trg;dmp;mcf;mli;ssp;urp
elseif. y -: 2 do.
  smoutput LoadMirrorXrefDb sdr;src;trg;dmp;mcf;mli;ssp;urp
```

```
elseif.do.  
  smoutput 'no ',MIRRORDB,' build - backup issue(s)!'  
end.  
)  
  
CheckRealDates=: 3 : 0  
  
NB.*CheckRealDates v-- check real dates.  
NB.  
NB. This verb scans all the (realdate*.txt) files in the smugmug  
NB. mirror directories for the occurrence of the python SmugPyter  
NB. bogus date of 9999-01-01. The python function  
NB. (get_album_image_real_dates) stopped working around May 24,  
NB. 2022 so I hacked in a marker date of (9999-01-01T00:00:00) to  
NB. mark affected images for later manual edits. This verb is  
NB. used to prevent such dates getting saved in (mirror.db)  
NB.  
NB. monad: bt =. CheckRealDates clPfx  
NB.  
NB. NB. empty table result indicates dates ok  
NB. ,. CheckRealDates '/real*.txt'  
NB.  
NB. dyad: bt =. iYYYYMMDD CheckRealDates clPfx  
  
BOGUSMARKDATE CheckRealDates y  
:  
NB. j profile !(*)=. dirtree  
t=. dirtree MIRRORPATH,y
```

*NB. date text for each file*

```
d=. (}.@(2&{"1@readtd2)&.> 0 {"1 t) -.&.> <a:
```

*NB. no real dates*

```
if. 1 e. b0=. 0 ~: #&> d do.
```

*NB. check any real dates*

```
ymd=. datefrnum&.> ".@&.> (-.&'-'')@('T'&beforestr) L: 0 b0#d
```

*NB. all dates should be valid Gregorian*

```
b1=. */.@valdate&> ymd
```

*NB. no bogus dates*

```
b2=. x&e.&> ymd
```

*NB. return any files with invalid or bogus dates*

```
t #~ (b2 +. -.b1) (b0#i.#b0)} b0
```

```
else.
```

```
(0,}.$t)$'' NB. no invalid dates
```

```
end.
```

```
)
```

```
CreateMirrorXrefDb=: 3 : 0
```

*NB.\*CreateMirrorXrefDb v-- creates sqlite mirror cross reference*

*NB. database.*

```
NB.
NB. monad: blclTableNames = CreateMirrorXrefDb clMirrorDb
NB.
NB.   CreateMirrorXrefDb 'c:/SmugMirror/Documents/XrefDb/mirror.db'

('database exists -> ',y) assert -.fexist y

NB. parse schema sql - assumes ordered create statements delimited by ';'
sql=. reb&.> <:_1 ';;', (LF,' ') charsub CreateMirror_sql -. CR

NB. create new empty database
dt=. sqlcreate_psqli_ y

NB. create tables
for_create. sql do.
  create=. ;create
  ('unable to create table ->',create) assert 0 = sqlcmd__dt create
end.

tabs=. sqltables__dt ''
tabs [ sqlclose__dt ''
)

Divisible=: 3 : 0

NB.*Divisible v-- albums with image counts that are divisible by
NB. 3 and 5.
NB.
```



*NB. This verb finds albums with image counts that are divisibe by  
NB. three and five. See the related verb (NotDivisible) for more  
NB. details.*

*NB.*

*NB. monad: bt =. Divisible clMirrorDb*

*NB.*

*NB. trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'*

*NB. Divisible trg*

*NB.*

*NB. dyad: bt =. ia Divisible clMirrorDb*

*NB.*

*NB. 2 5 Divisible trg*

3 5 Divisible y

:

*NB. !(\*)=. ImageCnt AlbumName*

(0 {"1 d)=. 1 {"1 d=. AlbumImageCount y

b=. \*/ 0 = r=. x |"0 1 ImageCnt

c=. (x {"1 >. ImageCnt %"0 1 x) - ImageCnt

(/: b # ImageCnt ) { (<"0 b # ImageCnt,.c) ,. b # AlbumName

)

DumpLocalImageNatural=: 3 : 0

*NB.\*DumpLocalImageNatural v-- dump (LocalImage) as TAB delimited*

*NB. text.*

*NB.*

*NB. (LocalImage) is the only table in (mirror.db) that contains  
NB. information that cannot be recreated from TAB delimited  
NB. SmugMirror text files and ThumbsPlus databases. (LocalImage)  
NB. matches online images to local images. Many can be matched by  
NB. file name but many require tedious human inspection. The  
NB. mapping is not one-to-one some online images, like panoramas,  
NB. are derived from many local images. This verb dumps  
NB. (LocalImage) in the form of TAB delimited natural keys that  
NB. preserves the online local pairing in durable version control  
NB. friendly form.*

*NB.*

*NB. monad: bl =. DumpLocalImageNatural (clDumpFile ; clMirrorDb)*

*NB.*

*NB. dmp=. 'c:/smugmirror/documents/xrefdb/locoxref.txt'*

*NB. trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'*

*NB. DumpLocalImageNatural dmp;trg*

*'dmp trg'=. y*

*dt=. sqlopen\_sqlite\_ trg*

*oc=. sqlsize\_\_dt 'OnlineImage'*

*ld=. sqldict\_\_dt LocalOnlineFile\_sql*

*rc=. sqlclose\_\_dt ''*

*NB. box unboxed columns and format as char*

*hd=. 0 {"1 ld [ td=. 1 {"1 ld*

*pos=. I. 0 = L.> td*

*td=. (":L:0(<"0)&.>pos{td) pos} td*

```
td=. |: >td
```

```
NB. write as TAB delimited file  
(hd,td) writetd2 dmp
```

```
NB. number of distinct local images  
utd=. # ~. (hd i. <'ImageKey') {"1 td
```

```
NB. unique match percentage below should equal this result  
NB. %/;(#> > 1{sqlread__dt 'select distinct ImageKey from LocalImage');sqlsize__dt 'OnlineImage'
```

```
NB. record count; unique match percentage; file  
(#td);(100 * utd%oc);dmp  
)
```

```
IsotimeFromThumbID=: 3 : 0
```

```
NB.*IsotimeFromThumbID v-- iso taken times from thumbs ids.  
NB.  
NB. monad: bl =. IsotimeFromThumbID ilThumbID
```

```
NB. sqlite addon !(*)=. sqlopen_psqlite_ sqlread__db sqlclose__db  
db=. sqlopen_psqlite_ PRIMARYTHUMBS  
k=. '(',{. ,',', ,. ":",.y) ,')'  
t=. sqlread__db 'select idThumb, taken_time_iso from Thumbnail where idThumb in ',k  
t [ sqlclose__db ''  
)
```

```
LoadAlbum=: 3 : 0
```

```
NB.*LoadAlbum v-- load (Album) table.
```

```
NB.
```

```
NB. (Album) references (LocalPath) execute (LoadLocalPath) before
```

```
NB. this verb.
```

```
NB.
```

```
NB. monad: iaRc =. LoadAlbum (clMirrorDir ; clMirrorDb)
```

```
NB.
```

```
NB. sdr=. 'c:/smugmirror/mirror' NB. smugmug mirror directory
```

```
NB. trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. smugmug mirror
```

```
NB. LoadAlbum sdr;trg
```

```
'sdr trg'=. y
```

```
NB. j profile !(*)=. dirtree
```

```
NB. all mirror directory albums contain an (ainfo-*.txt) file
```

```
ai=. 0 {"1 dirtree (tslash2 sdr), 'ainfo-*.txt'
```

```
NB. standarize path format
```

```
pf=. tolower@('/'&beforelaststr)@('/'&afterstr)&.> ai
```

```
NB. fetch local path table
```

```
dt=.sqlopen_sqlite_ trg
```

```
dat=. sqldict__dt 'LocalPath'
```

```
NB. match ainfo paths with local path table
```



```
dat=. (<_1&".&> ;3{dat) (3)} dat
```

```
NB. insert in Album table
```

```
cln=. 'AlbumKey LocalPathID LocalPresent OnlineImageCount OnlineCreateDate'
```

```
cln=. ;:cln,' LastUpdated ImagesLastUpdated AlbumName ParentFolders WebUri AlbumDescription'
```

```
rc=. sqlinsert__dt 'Album';cln;<dat
```

```
rc [ sqlclose__dt ''
```

```
)
```

```
LoadImageAlbumXr=: 3 : 0
```

```
NB.*LoadImageAlbumXr v-- load (ImageAlbumXr) table.
```

```
NB.
```

```
NB. monad: iaRc =. LoadImageAlbumXr (clDb ;< btclDat)
```

```
'trg dat'=. y
```

```
dt=. sqlopen_psqliite_ trg
```

```
rc=. dt insqltd 'ImageAlbumXr';<dat
```

```
rc [ sqlclose__dt ''
```

```
)
```

```
LoadImageKeywordXr=: 3 : 0
```

```
NB.*LoadImageKeywordXr v-- load (ImageKeywordXr) table.
```

```
NB.
```

```
NB. monad: iaRc =. LoadImageKeywordXr (clDb ; <blclDat)
```

```
NB.
```

```
NB. sdr=. 'c:/smugmirror/mirror'          NB. mirror directory
NB. trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. smugmug mirror
NB. 'img iax'=. MirrorImageXrTables sdr
NB. LoadOnlineKeyword trg;<img
```

```
'trg dat'=. y
dat=. }.dat [ head=. 0{dat
```

```
'image keys'=. <"1 |: (head i. ;:'ImageKey Keywords') {"1 dat
keys=. <;._1&.> (';' ,&.> keys) -.&.> ' '
image=. (#&> keys) # image
```

```
NB. insert image keyword xref
dt=. sqlopen_psqli_ trg
rc=. sqlinsert__dt 'ImageKeywordXr';(;:'ImageKey Keyword');<image;<;keys
rc [ sqlclose__dt ''
)
```

```
LoadLocalPath=: 3 : 0
```

```
NB.*LoadLocalPath v-- load (LocalPath) table.
```

```
NB.
```

```
NB. (LoadLocalPath) uses values from a ThumbsPlus SQLite (Path)
```

```
NB. table. ThumbsPlus builds a complete table of unique paths and
```

```
NB. and path primary keys. All the paths (mirror.db) will
```

```
NB. reference will be in this table.
```

```
NB.
```

```
NB. monad: iaRc =. LoadLocalPath (clThumbsDb ; clMirrorDb)
NB.
NB.   src=. 'c:/thumbsdbs/working2018.tpdb8s'      NB. thumbsplus
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. smugmug mirror
NB.   LoadLocalPath src;trg

'src trg'=. y

NB. fetch thumbsplus data
ds=. sqlopen_psqli_ src
dat=. sqlreads__ds 'select idPath, name from Path'
rc=. sqlclose__ds ''

NB. convert path delimiters
paths=. allwhitetrim&.> <"1 '\\/' charsub ;1{1{dat
ids=. , ;0{1{dat

NB. insert in LocalPath
dt=. sqlopen_psqli_ trg
rc=. sqlinsert__dt 'LocalPath';(;;'LocalPathID LocalPath');<ids;<paths
rc [ sqlclose__dt ''
)

LoadMirrorXrefDb=: 3 : 0

NB.*LoadMirrorXrefDb v-- loads new mirror cross reference
NB. database.
NB.
```



```
NB. monad:  btNameCnts = LoadMirrorXrefDb (clMirrorDr ; clThumbsDb ; clMirrorDb)
NB.
NB.  sdr=. 'c:/smugmirror/mirror'          NB. mirror directory
NB.  src=. 'c:/thumbsdb/primary2018.tpdb8s'  NB. thumbsplus db
NB.  trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'  NB. mirror db
NB.  dmp=. 'c:/smugmirror/documents/xrefdb/locoæref.txt'  NB. online local pairs
NB.  mcf=. 'c:/smugmirror/documents/xrefdb/manlocoæref.txt'  NB. missing local online corrections
NB.  mli=. 'c:/smugmirror/documents/xrefdb/locomiss.txt'  NB. missing local images report
NB.  ssp=. 'c:/smugmirror/documents/xrefdb/suspects.txt'  NB. suspicious image pair report
NB.  urp=. 'c:/smugmirror/documents/xrefdb/upratesum.txt'  NB. upload summary report
NB.  LoadMirrorXrefDb sdr;src;trg;dmp;mcf;mli;ssp;urp

'sdr src trg dmp mcf mli ssp urp'=. y

NB. thumbs db must exist
if. 0 e. fexist src do. smoutput 'thumbs db missing' return. end.

smoutput 'Creating ',trg,' ...'
tabs=. CreateMirrorXrefDb trg

smoutput 'Loading path and albums ...'
LoadLocalPath src;trg
LoadAlbum sdr;trg

smoutput'Loading keywords ...'
'img iax'=. MirrorImageXrTables sdr
kw=. }. ((0{img) i. <'Keywords') {"1 img
```

```
LoadOnlineKeyword trg;<kw

smoutput 'Loading Images and cross references ...'
LoadOnlineImage trg;<img
LoadImageAlbumXr trg;<iax
LoadImageKeywordXr trg;<img

smoutput 'Checking existence of downloaded images ...'
UpdateLocalPresent trg

smoutput 'Matching online and local files with same file names ...'
MatchOnlineLocal mcf;src;trg

smoutput 'Matching online and local files after [] bracket suffix removal ...'
MatchOnlineNoBrackets mcf;src;trg

smoutput 'Matching manual local online files corrections ...'
MatchManual mcf;src;trg

smoutput 'Dumping current online local image pairs as TAB delimited text -> ',dmp
smoutput DumpLocalImageNatural dmp;trg

smoutput 'Writing missing images report -> ',mli
0 0$MissingImagesReport mli;trg

smoutput 'Writing suspicious pairs report -> ',ssp
0 0$SuspiciousPairReport ssp;trg
```

```
smoutput 'Writing upload summary report -> ',urp
0 0$MirrorStatReport urp;trg
)
```

```
LoadOnlineImage=: 3 : 0
```

```
NB.*LoadOnlineImage v-- load (OnlineImage) table.
```

```
NB.
```

```
NB. monad: iaRc =. LoadOnlineImage (clDb ;< btclDat)
```

```
'trg dat'=. y
```

```
dat=. <"1 |: }. dat [ head=. 0{dat
```

```
NB. convert numeric columns
```

```
pos=. head i. ;:'ArchivedSize Altitude OriginalHeight OriginalWidth'
```

```
dat=. ((SQLITE_NULL_INTEGER_psqli_&".&>) L: 1 [ pos{dat) pos} dat
```

```
pos=. head i. ;:'Latitude Longitude'
```

```
dat=. ((SQLITE_NULL_FLOAT_psqli_&".&>) L: 1 [ pos{dat) pos} dat
```

```
dt=. sqlopen_psqli_ trg
```

```
rc=. sqlinsert__dt 'OnlineImage';head;<dat
```

```
rc [ sqlclose__dt ''
```

```
)
```

```
LoadOnlineKeyword=: 3 : 0
```

```
NB.*LoadOnlineKeyword v-- load (OnlineKeyword) table.
NB.
NB. monad: LoadOnlineKeyword (clDb ; <blclKeywords)
NB.
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. smugmug mirror
NB.   keys=. 'boo;hoo;foo' ; 'yoo;key;me'           NB. keyword lists
NB.   LoadOnlineKeyword trg;<keys

'trg keys'=. y

if. #keys=. <;._1 (;' ' ,&.> keys) -. ' ' do.
  NB. insert unique keywords and frequencies
  'kw fq'=. ofreq s: keys
  dt=. sqlopen_psqliite_ trg
  rc=. sqlinsert__dt 'OnlineKeyword';(;'Keyword KeyFrequency');<(5&s: kw);fq
  rc [ sqlclose__dt ''
else.
  0
end.
)

LocalFrOnline=: 4 : 0

NB.*LocalFrOnline v-- local file names from online keys and
NB. filenames.
NB.
NB. Local file names are derived from online names by prefixing
NB. the name with the image key, followed by a lower case base 36
```

```
NB. case mask, followed by the online file name. All blanks are
NB. replaced with hyphen '-' characters.
NB.
NB. dyad: bclObj LocalFrOnline clAlbumKey
NB.
NB. db=. sqlopen_psqli_ 'c:/smugmirror/documents/xrefdb/mirror.db'
NB. db LocalFrOnline 'BFs8q4'

NB. fetch album
'invalid (AlbumKey)' assert 0 < #y

NB. use of sqlparm sometimes leaves databases open
NB. dat=. sqlparm__x LocalFile_sql;SQLITE_TEXT_psqli_;y
sql=. ('/?/','',y,'') changestr LocalFile_sql
dat=. sqldict__x sql

nofiles=. 0$<'
if. 0 e. #&> 1 {"1 dat do. nofiles return. end.

NB. table columns !(*)=. ImageKey OnlineImageFile LocalPath
(0 {"1 dat)=. boxopen&.> 1 {"1 dat

if. #ImageKey do.
  pfx=. ImageKey ,&.> '-' ,&.> (b36casemask ImageKey) ,&.> '-'
  (<MIRRORHEAD) ,&.> LocalPath ,&.> '/' ,&.> pfx ,&.> '-'&charsub&.> OnlineImageFile
else.
  nofiles
```

```
end.  
)
```

```
LocalFromDir=: 3 : 0
```

```
NB.*LocalFromDir v-- local files with directory match (y) and  
NB. file match (x).
```

```
NB.
```

```
NB. A utility for browsing local files. Used from resolving  
NB. mismatches.
```

```
NB.
```

```
NB. monad: btcl =. LocalFromDir clPathPat
```

```
NB.
```

```
NB. LocalFromDir 'Petroglyph'
```

```
NB.
```

```
NB. dyad: btcl =. clFilePat LocalFromDir clPathPat
```

```
NB.
```

```
NB. 'hand' LocalFromDir 'Petroglyph'
```

```
'' LocalFromDir y
```

```
:
```

```
if. #x do. d=. ' and a.name like ''%',x,'%'' else. d=. '' end.
```

```
sql=. 'select * from Thumbnail a inner join Path b on a.idPath=b.idPath where b.name like ''%', y ,'%''',d
```

```
db=. sqlopen_psycopg2_ PRIMARYTEST
```

```
r=. sqldict__db sql
```

```
sqlclose__db ''
```

```
'path name'=. (1 {"1 r) #~ (0 {"1 r) = <'name'
```

```
name ,. path
)

MatchManual=: 3 : 0

NB.*MatchManual v-- insert manual online local image pair
NB. corrections.
NB.
NB. This verb reads a TAB delimited file of manual online and
NB. local image pairings and inserts valid pairs into the mirror
NB. cross reference database. Manual corrections are necessary
NB. for online images with file names that do not follow patterns
NB. handled by (MatchOnlineLocal) and (MatchOnlineNoBrackets).
NB.
NB. monad: iaRc =. MatchManual (clFixFile ; clThumbsDb ; clMirrorDb)
NB.
NB.   src=. 'c:/thumbsdbs/primary2018.tpdb8s'
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB.   mcf=. 'c:/smugmirror/documents/xrefdb/manlocoxref.txt'
NB.   MatchManual mcf;src;trg

'mcf src trg'=. y
rc=. 0 NB. success

if.-.fexist mcf do.
  rc=._1 [ smoutput 'Manual correction(s) file missing - skipping adjustments ... ' return.
end.
```

*NB. manual corrections - remove commented lines -- cannot comment header*

```
mc=. ];._2 tlf (read mcf) -. CR
mc=. parsetd ctl mc #~ -. 0 {"1 (,: '--') E. mc
```

```
mc=. }. mc [ hd=. 0 { mc
'lp lf of'=. hd i. ;:'LocalPath LocalImageFile OnlineImageFile'
```

*NB. look up path IDs and online image keys*

*NB. (\*)=. LocalPathID LocalPath OnlineImageFile ImageKey LocalThumbID*

```
dt=. sqlopen_psqlite_ trg
du=. sqldict__dt 'LocalPath'
dv=. sqldict__dt 'OnlineImageFile,ImageKey from OnlineImage'
rc=. sqlclose__dt''
```

```
(0{"1 du)=. 1 {"1 du
'missing manual local path(s)' assert (#LocalPath) > pos=. LocalPath i. lp {"1 mc
lpid=. pos { LocalPathID
```

```
(0{"1 dv)=. 1 {"1 dv
'invalid manual online image(s)' assert (#OnlineImageFile) > pos=. OnlineImageFile i. of {"1 mc
olik=. pos { ImageKey
```

*NB. look up thumbsplus image ID - used as LocalThumbID*

```
ds=. sqlopen_psqlite_ src
du=. sqldict__ds 'idThumb as LocalThumbID, name as LocalImageFile, idPath as LocalPathID from Thumbnail'
rc=. sqlclose__ds''
```



*NB. use symbols - local file list is large*

```
(O{"1 du)=. 1 {"1 du
LocalImageFile=. s: LocalImageFile
'invalid manual local image(s)' assert (#LocalImageFile) > pos=. LocalImageFile i. s: lf {"1 mc
lifp=. pos
```

*NB. match on path id and local file name*

```
pos=. (LocalPathID ,. i.~ LocalImageFile) i. lpid ,. lifp
'missing manual local path image pairs(s)' assert pos < #LocalImageFile
ltid=. pos { LocalThumbID
```

*NB. insert manual local online pairs in LocalImage table*

```
cln=. ;:'LocalPathID LocalThumbID LocalImageFile ImageKey'
du=. lpid;ltid;(lf {"1 mc);<olik
dt=. sqlopen_psqliite_ trg
rc=. sqlinsert__dt 'LocalImage';cln;<du
rc [ sqlclose__dt ''
)
```

MatchOnlineLocal=: 3 : 0

*NB.\*MatchOnlineLocal v-- match online files with local files.*

*NB.*

*NB. Online files are, with few exceptions, JPG files while local*

*NB. files are mostly TIF files. This verb exactly matches online*

*NB. file names with local names. This exact match picks up over*

*NB. 1500 images which is better than I expected. Matching all*

*NB. online images to local files will be an ongoing little*

```
NB. project.
NB.
NB. verbatim: online files are:
NB.
NB. 1. often renamed
NB. 2. retyped (tif,nef -> jpg)
NB. 3. can derive from many originals (panoramas)
NB.
NB. monad: iaRc = MatchOnlineLocal (clThumbsDb ; clMirrorDb)
NB.
NB.   src=. 'c:/thumbsdbs/primary2018.tpdb8s'
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB.   mcf=. 'c:/smugmirror/documents/xrefdb/manlocoxref.txt'
NB.   MatchOnlineLocal mcf;src;trg

'mcf src trg'=. y
ds=. sqlopen_sqlite_ src
dt=. sqlopen_sqlite_ trg

NB. local file names and ids !(*)=. idPath idThumb name
ld=. sqldict__ds 'idPath, idThumb, name from Thumbnail'
(0 {"1 ld)=. 1 {"1 ld
rc=. sqlclose__ds ''
local=. justfile&.> name

NB. online ImageKey and file names !(*)=. ImageKey OnlineImageFile
td=. sqldict__dt 'ImageKey, OnlineImageFile from OnlineImage'
```

```
(0 {"1 td)=. 1 {"1 td

if. fexist mcf do.
  NB. manual corrections
  mc=. }. mc [ hd=. 0 { mc=. readtd2 mcf
  of=. hd i. <'OnlineImageFile'
  NB. remove any manual correction files
  bm=. -.OnlineImageFile e. of {"1 mc
  OnlineImageFile=. bm # OnlineImageFile
  ImageKey=. bm # ImageKey
end.

OnlineImageFile=. justfile&.> OnlineImageFile

NB. local/online exact matches
pos=. local i. OnlineImageFile [ rc=. 0
if. #mch=. pos -. #local do.

  NB. insert matched
  NB. NOTE: renamed columns - first row original - next new name
  NB. idPath      idThumb
  NB. LocalPathID LocalThumbID
  clns=. ;:'LocalPathID LocalThumbID LocalImageFile ImageKey'
  dat=. (mch{idPath});(mch{idThumb});(mch{name});<(pos < #local)#ImageKey
  dat=. 'LocalImage';clns;<dat
  rc=. sqlinsert__dt dat
```

```
end.
```

```
rc [ sqlclose__dt ''  
)
```

```
MatchOnlineNoBrackets=: 3 : 0
```

```
NB.*MatchOnlineNoBrackets v-- match online files with local files  
NB. without [] suffix.
```

```
NB.
```

```
NB. For many years I attempted to pair online images with local  
NB. images by affixing a bracketed suffix with the online key in  
NB. square [] brackets. When I migrated many of my images from  
NB. Flickr to SmugMug I stripped the bracket suffix from many  
NB. file names. By removing bracket suffixes more than 700  
NB. matches can be added to what (MatchOnlineLocal) already  
NB. found.
```

```
NB.
```

```
NB. monad: iaRc = MatchOnlineNoBrackets (clThumbsDb ; clMirrorDb)  
NB.
```

```
NB.   src=. 'c:/thumbsdbs/primary2018.tpdb8s'
```

```
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
```

```
NB.   fix=. 'c:/smugmirror/documents/xrefdb/manlocoxref.txt'
```

```
NB.   MatchOnlineNoBrackets fix;src;trg
```

```
'mcf src trg'=. y
```

```
ds=. sqlopen_psqli_ src
```

```
dt=. sqlopen_psqli_ trg
```

*NB. files with []'ed and nonbracketed versions*

```
ovb=. BracketOverlaps ds
```

*NB. local file names and ids !(\*)=. idPath idThumb name*

```
ld=. sqldict__ds 'select idPath, idThumb, name from Thumbnail where name like ''[%]%''  
(0 {"1 ld)=. 1 {"1 ld  
rc=. sqlclose__ds ''  
if. 0=#name do. rc=. sqlclose__dt '' return. end.
```

*NB. strip [] suffixes from local file names*

```
local=. alltrim@('['&beforestr)&.> name
```

*NB. removing suffixes might create duplicates*

```
bm=. ~:local  
if. -.1 e. bm do. rc=. sqlclose__dt '' return. end.  
local=.    bm # local  
name=.    bm # name  
idPath=.  bm # idPath  
idThumb=. bm # idThumb
```

*NB. remove any previously matched images !(\*)=. LocalImageFile*

```
td=. sqldict__dt 'select LocalImageFile from LocalImage where LocalImageFile like ''[%]%''  
(0 {"1 td)=. 1 {"1 td  
bm=. -.name e. LocalImageFile  
bm=. bm +. -.local e. justfile&.> LocalImageFile  
local=.    bm # local
```

```
name=.    bm # name
idPath=.  bm # idPath
idThumb=. bm # idThumb
if. 0=#name do. rc=. sqlclose__dt '' return. end.

NB. online ImageKey and file names !(*)=. ImageKey OnlineImageFile
td=. sqldict__dt 'select ImageKey, OnlineImageFile from OnlineImage'
(0 {"1 td)=. 1 {"1 td

OnlineImageFile=. justfile&.> OnlineImageFile

if. fexist mcf do.
  NB. manual corrections
  mc=. }. mc [ hd=. 0 { mc=. readtd2 mcf
  of=. hd i. <'OnlineImageFile'
  NB. remove any manual corrections
  bm=. -.OnlineImageFile e. justfile&.> of {"1 mc
  OnlineImageFile=. bm # OnlineImageFile
  ImageKey=. bm # ImageKey
end.

NB. removing suffixes can over insert when both the []'ed
NB. and non bracketed files exist - the long term fix
NB. is to find and rename the mismatched files
bm=. -.OnlineImageFile e. ovb
OnlineImageFile=. bm # OnlineImageFile
ImageKey=. bm # ImageKey
```

```
if. 0=#OnlineImageFile do. rc=. sqlclose__dt '' return. end.

NB. local/online exact matches after suffixes removed
pos=. local i. OnlineImageFile [ rc=. 0
if. #mch=. pos -. #local do.

  NB. insert matched
  NB. NOTE: renamed columns - first row original - next new name
  NB. idPath      idThumb
  NB. LocalPathID LocalThumbID
  clns=. ;:'LocalPathID LocalThumbID LocalImageFile ImageKey'
  dat=. (mch{idPath});(mch{idThumb});(mch{name});<(pos < #local)#ImageKey
  dat=. 'LocalImage';clns;<dat
  rc=. sqlinsert__dt dat

end.

rc=. sqlclose__dt ''
)

MirrorImageXrTables=: 3 : 0

NB.*MirrorImageXrTables v-- scan manifest/realdate files and
NB. return image and imagealbum xref tables.
NB.
NB. monad: ((<btclImage), <btclXref) =. MirrorImageXrTables clRoot
NB.
NB. 'img xref'=. MirrorImageXrTables 'c:/SmugMirror/Mirror'
```

```
NB. z locale !(*)=. dirtree
img=. 2#<0 0$a:
if. #files=. dirtree (tslash2 y),'manifest-*.txt' do.

NB. for each manifest file there is a real date file
'missing real date file(s)' assert fexist rfiles=. RealDateFrManifest 0 {"1 files

NB. all manifest/real date files have same layout get headers
head=. 0{readtd2 ;0{0{files
'image album'=. head i. ;:'ImageKey AlbumKey'
'missing (ImageKey, AlbumKey) column(s)' assert (image,album) < #head

NB. read all manifest files
img=. ; }.@readtd2&.> 0 {"1 files

NB. image album cross reference - insure unique rows
iax=. ~. ((image,album){head) , (image,album) {"1 img

NB. reduce on image key - there are duplicate
NB. images in the python smugpyter directories
b=. head ~: <'AlbumKey'
img=. b #"1 img [ head=. b # head
img=. img #~ ~: image {"1 img

NB. insert new column in table schema order
b=. 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1
```



```
img=. b (#^:_1)"1 img
head=. b (#^:_1) head

NB. rename FileName -->> OnlineImageFile and insert new column
head=. (<'OnlineImageFile') (head i. <'FileName'}) head
head=. (<'RealDate') (I. -.b)} head

NB. update column positions
'image imdate'=. head i. ;:'ImageKey RealDate'

NB. merge in real dates
rdhead=. 0{readtd2 ;0{0{rdfiles
'rdimage rddate'=. rdhead i. ;:'ImageKey RealDate'
'missing (ImageKey, RealDate) column(s)' assert (rdimage,rddate) < #rdhead
rd=. ; }.@readtd2&.> rdfiles
pos=. (image {"1 img) i. rdimage {"1 rd
if. +./b=. pos < #img do.
  pos=. b # pos
  img=. (b # rddate {"1 rd) (<pos;imdate)} img
end.

NB. image table and xref
(<head,img),<iax
else.
  img
end.
)
```

```
MirrorStatReport=: 3 : 0
```

```
NB.*MirrorStatReport v-- mirror database upload summary report.
```

```
NB.
```

```
NB. monad: cl =. MirrorStatReport (clReportFile ; clMirrorDb)
```

```
NB.
```

```
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
```

```
NB.   urp=. 'c:/smugmirror/documents/xrefdb/upratesum.txt'
```

```
NB.   MirrorStatReport urp;trg
```

```
'urp trg'=. y
```

```
cnts=. TableCounts trg
```

```
'all yrc'=. WeekUploadRates trg
```

```
gst=. NonEmptyGalleryStats trg
```

```
wy=. weeksinyear {. 6!:0 ''
```

```
gp=. 2#LF
```

```
r=.LF,'mirror.db upload summary for: ',timestamp ''
```

```
r=.r,gp,'Online image count:           ', ": ;((0{cnts) i. <'OnlineImage'){ 1{cnts
```

```
r=.r,LF,'Overall weekly cy upload rate: ', ":ur=. {: {: all
```

```
r=.r,LF,'Overall cy upload count:       ', ": _2 { {: all
```

```
r=.r,LF,'Estimated overall cy uploads:   ', ":1 round ur * wy
```

```
r=.r,LF
```

```
r=.r,LF,'This year weekly cy upload rate: ', ":yr=. {: {: yrc
```

```
r=.r,LF,'This year cy upload count:      ',": _2 { {: yrc
r=.r,LF,'Estimated year cy uploads:      ',":1 round yr * wy

r=.r,gp,'Nonempty gallery count statistics'
r=.r,LF,ctl gst

r=.r,gp,'Table row counts'
portchars '' [ cchars=. 9!:6 ''
r=.r,LF,ctl ":cnts

r=.r,gp,'First five nondivisible galleries'
r=.r,LF,ctl ":5 {. NotDivisible trg

NB. write upload rate summary report
r [ (toHOST r) write urp [ 9!:7 cchars
)

MissingImagesReport=: 3 : 0

NB.*MissingImagesReport v-- missing local images report.
NB.
NB. monad: clReportFile =. MissingImagesReport (clMissingFile ; clMirrorDb)
NB.
NB. mli=. 'c:/smugmirror/documents/xrefdb/locomiss.txt'
NB. trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB. MissingImagesReport mli;trg

'mli trg'=. y
```

*NB. switch to portable box characters*

```
portchars '' [ cchars=. 9!:6 ''  
dt=. sqlopen_sqlite_ trg  
dat=. ctl ": sqlreads__dt MissingLocalFiles_sql  
9!:7 cchars [ sqlclose__dt ''
```

*NB. write report text*

```
r [ (r=. toHOST dat) write mli  
)
```

NonEmptyGalleryStats=: 3 : 0

*NB.\*NonEmptyGalleryStats v-- summary statistics of nonempty galleries.*

*NB.*

*NB. monad: ctStats =. NonEmptyGalleryStats clMirrorDb*

*NB.*

*NB. trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. smugmug mirror*

*NB. NonEmptyGalleryStats trg*

*NB. require 'data/sqlite' !(\*)=. ImageCnt sqlopen\_sqlite\_ sqldict\_\_dt sqlclose\_\_dt*

```
dt=. sqlopen_sqlite_ y  
d=. sqldict__dt AlbumImageCount_sql  
(0 {"1 d)=. 1 {"1 d  
dstat ImageCnt [ sqlclose__dt ''  
)
```

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. divisible 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 -.pwcfc 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]'
)
```

```
RealDateFrManifest=: 3 : 0
```

```
NB.*RealDateFrManifest v-- real date files from manifest files.
```

```
NB.
```

```
NB. monad: pl =. RealDateFrManifest blclManifestFiles
```

```
NB.
```

```
NB. RealDateFrManifest 0 {"1 dirtree jpath '~temp/manifest-*.txt'
```

```
NB. assumes use of (dirtree) - hence / path delimiter
```

```
paths=. tslash2&.> '/'&beforelaststr&.> y
```

```
paths ,&.> 'realdate-'&.> (#'manifest-') }.&.> '/'&afterlaststr&.> y
)
```

```
SetBogusRealDates=: 3 : 0
```

```
NB.*SetBogusRealDates v-- set bogus real dates in one real dates
```

```
NB. file.
```

```
NB.
```

```
NB. This verb sets bogus real dates to corresponding iso times
```

```
NB. fetched from the local primary ThumbsPlus database. The
```

```
NB. changes are written to a corresponding (fix) file in the same
NB. directory.
NB.
NB. monad: clFixFile =. SetBogusRealDates clFileRealDates
NB.
NB. p=. 'c:/smugmirror/mirror/Other/DirectCellUploads/'
NB. f=. p,'realdate-DirectCellUploads-RMWQ6K-1p.txt'
NB. SetBogusRealDates f
NB.
NB. NB. set bogus dates over many galleries
NB. ,. SetBogusRealDates@.> 0 {"1 CheckRealDates '/real*.txt'

if. #t=. ThumbsRealDates y do.

  NB. fetch real date file
  d=. readtd2 y
  c=. (0{d) i. ;:'ImageKey RealDate'
  k=. (0{c) {"1 d

  NB. positions of iso times
  p=. k i. 0 {"1 t

  NB. merge iso times
  s=. (1 {"1 t) (<p;1{c}) d

  NB. write date insertions to renamed file
  f=. ('.txt'&beforestr y),'.fix'
```

```
f [ (toHOST fmttd s) write f  
  
else.  
  '' [ smoutput 'no bogus dates ->';y  
end.  
)
```

```
SuspiciousPairReport=: 3 : 0
```

```
NB.*SuspiciousPairReport v-- suspicious local and online file  
NB. pairings.  
NB.  
NB. Online images are almost entirely jpg files with some gif,  
NB. png and avi files. Typically I create local tif files that I  
NB. upload as jpg. Hence, any computed local online pairing that  
NB. does not pair files of these types is questionable.  
NB.  
NB. Suspicious files need to be manually inspected and faulty  
NB. pairings should be corrected in the (manlocoxref.txt) file.  
NB.  
NB. monad: clSuspectFile =. SuspiciousPairReport (clSuspectFile ; clMirrorDb)  
NB.  
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'  
NB.   ssp=. 'c:/smugmirror/documents/xrefdb/suspectpairs.txt'  
NB.   SuspiciousPairReport ssp;trg  
  
'ssp trg'=. y
```



```
NB. get local online file pairing
dt=. sqlopen_sqlite_ trg
du=. sqldict__dt LocalOnlineFile_sql
rc=. sqlclose__dt''

NB. !(*)=. LocalPath LocalImageFile OnlineImageFile RealDate
(0 {"1 du)=. 1 {"1 du

NB. suspect file extension mask
ext=. tolower@justext&.> LocalImageFile
b=. ext e. (~.ext) -. ;:'jpg tif gif png avi'

NB. suspicious file pairing table
h=. ;:'LocalPath LocalImageFile OnlineImageFile RealDate'
du=. h , /::~ b # LocalPath ,. LocalImageFile ,. OnlineImageFile ,. RealDate

NB. switch to portable box characters
portchars '' [ cchars=. 9!:6 ''
du=. ctl ": du
9!:7 cchars

NB. write suspect report
r [(r=. toHOST du) write ssp
)

TableCounts=: 3 : 0

NB.*TableCounts v-- table row counts.
```

```
NB.
NB. monad: bt =. TableCounts clMirrorDb
NB.
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'
NB.   TableCounts trg

NB. require 'data/sqlite' !(*)=. sqlclose__dt sqlopen_psqlite_ sqlsize__dt sqltables__dt
dt=. sqlopen_psqlite_ y
if. #tabs=. sqltables__dt '' do. cnts=. tabs ,: sqlsize__dt.> tabs else. cnts=. 0 0$a: end.
cnts [ sqlclose__dt ''
)

ThumbIDFromImageKey=: 3 : 0

NB.*ThumbIDFromImageKey v-- fetch thumbsplus image ids from
NB. smugmug image keys.
NB.
NB. monad: bl =. ThumbIDFromImageKey clImageKeys

NB. sql image keys
sk=. '(',{. ; ', '&,&.> dblquote y),''

NB. fetch thumb ids !(*)=. sqlopen_psqlite_ sqlread__db sqlclose__db
db=. sqlopen_psqlite_ MIRRORDBPATH,MIRRORDBTEMP
t=. sqlread__db 'select LocalThumbID, ImageKey from LocalImage where ImageKey in ',sk
t [ sqlclose__db ''
)
```

```
ThumbsRealDates=: 3 : 0
```

```
NB.*ThumbsRealDates v-- thumbsplus real dates for bogus real  
NB. dates.
```

```
NB.
```

```
NB. This verb finds thumbsplus iso times for bogus real dates.  
NB. The thumbsplus dates will typically match online image dates  
NB. as online real dates are derived from local images. However,  
NB. not all images will have database iso times. Such images will  
NB. be flagged and will require manual edits.
```

```
NB.
```

```
NB. monad: ThumbsRealDates clFileRealDates
```

```
NB.
```

```
NB. p=. 'c:/smugmirror/mirror/Other/DirectCellUploads/'
```

```
NB. f=. p,'realdate-DirectCellUploads-RMWQ6K-1p.txt'
```

```
NB. ThumbsRealDates f
```

```
nodates=. 0 2$a:
```

```
if. #t=. BogusRealDates y do.
```

```
NB. image keys !(*)=. LocalThumbID ImageKey
```

```
(;{.ti)=. ;{.ti=. ThumbIDFromImageKey }. ((0{t) i. <'ImageKey') {"1 t
```

```
NB. thumbsplus times !(*)=. idThumb taken_time_iso
```

```
(;{.iso)=. ;{.iso=. IsotimeFromThumbID LocalThumbID
```

```
if. b=. 0 e. #&> taken_time_iso do.
  smoutput 'WARNING: missing thumbsplus taken times ->';y
  if. (#taken_time_iso) = +/b do.
    smoutput 'WARNING: all thumbsplus taken times missing ->';y
    nodates return.
  end.
end.

NB. image keys and real dates formatted for real date file
p=. idThumb i. LocalThumbID
d=. ImageKey ,. '.'&beforestr.> p{taken_time_iso

NB. images with thumbsplus taken times
d=. (;:'ImageKey RealDate') , d #~ 0 < #&> 1 {"1 d

else.
  smoutput 'no bogus dates ->';y
  nodates
end.
)

UpdateLocalPresent=: 3 : 0

NB.*UpdateLocalPresent v-- set (LocalPresent) in (Album) to 1 if
NB. all local images exist.
NB.
NB. monad: iaRc =. UpdateLocalPresent clMirrorDb
NB.
```

```
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db'  NB. smugmug mirror
NB.   UpdateLocalPresent trg
```

```
NB. get albums !(*)=. AlbumKey AlbumName
rc=. 0
dt=. sqlopen_psqli_t _y
al=. sqldict__dt 'AlbumKey, AlbumName from Album'
(0 {"1 al)=. 1 {"1 al
if. 0=#AlbumKey do. rc [ sqlclose__dt '' return. end.
```

```
bok=. 0 #~ #AlbumKey
for_pos. i.#AlbumKey do.
  ak=. ;pos{AlbumKey
  an=. ;pos{AlbumName
  smoutput 'Checking ',an,' ...'
  files=. dt LocalFrOnline ak
  b=. fexist files
  if. (0 e. b) *. 0 < #files do.
    smoutput 'missing local album sample file(s)'
    smoutput >files # -.b
  else.
    NB. all album files present
    bok=. 1 pos} bok
```

```
NB. NOTE: faster to scan all files and issue one update
NB. WARNING: this method leaves (mirror.db) open despite
NB. being closed in all cases - this is not a problem when
```

```
NB. run from (buildmirror.bat) that terminates the entire
NB. process and closes (mirror.db).
NB. rc=. sqlparm__dt UpdateLocalPresent_sql;SQLITE_TEXT_psqlite_;ak
NB. if. rc ~:0 do. break. end.

end.
end.

NB. issue one update
if. 1 e. bok do.
  sql=. UpdateLocalPresent_sql,'(','{.};',' ,&.> quote&.> bok#AlbumKey),')'
  rc=. sqlcmd__dt sql
end.

rc [ sqlclose__dt ''
)

WeekUploadRates=: 3 : 0

NB.*WeekUploadRates v-- computes weekly image upload rates.
NB.
NB. monad: (ft ; ft) =. WeekUploadRates clMirrorDb
NB.
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. smugmug mirror
NB.   WeekUploadRates trg

NB. require 'data/sqlite' !(*)=. sqlopen_psqlite_ sldict__dt sqlclose__dt
NB. get uploads per year and images per year - sorted on year
```

```
dt=. sqlopen_psqlite_ y
sql=. '/{{date}}/UploadDate' changestr UploadRateCount_sql
uy=. sqldict__dt sql
sql=. '/{{date}}/RealDate' changestr UploadRateCount_sql
iy=. sqldict__dt sql
sqlclose__dt ''
```

*NB. all uploads per year - first biases rates - last incomplete*

```
(0 {"1 uy)=. 1 {"1 uy
ImageCnt=. }. ImageCnt [ Year=. "&> }. Year
LastCnt=. {: ImageCnt [ LastYear=. {:Year
uy=. }: Year ,. ImageCnt ,. ImageCnt % weeksinyear Year
wn=. {: weeknumber today 0
uy=. uy , LastYear , LastCnt , LastCnt % wn
```

*NB. images per year rates for common years - first year NULL*

```
cy=. Year
(0 {"1 iy)=. 1 {"1 iy
ImageCnt=. }. ImageCnt [ Year=. "&> }. Year
b=. Year e. cy
ImageCnt=. b # ImageCnt [ Year=. b # Year
LastCnt=. {: ImageCnt [ LastYear=. {:Year
iy=. }: Year ,. ImageCnt ,. ImageCnt % weeksinyear Year
iy=. iy , LastYear , LastCnt , LastCnt % wn
```

*NB. rate tables*

```
(<uy),<iy
```

)

*NB. retains string (y) after last occurrence of (x)*

```
afterlaststr=: ] }.~ #@[ + 1&(i:~)@([ E. ])
```

*NB. retains string after first occurrence of (x)*

```
afterstr=: ] }.~ #@[ + 1&(i.~)@([ E. ])
```

*NB. trims all leading and trailing blanks*

```
alltrim=: ] #~ [: -. [: (*./\ . +. */.\) ' '&=
```

*NB. trims all leading and trailing white space*

```
allwhitetrims=: ] #~ [: -. [: (*./\ . +. */.\) ] e. (9 10 13 32{a.})"_
```

```
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. signal with optional message*

```
assert=: 0 0"_$ 13!:8^:((0: e. ])^ (12"_))
```

```
b36casemask=: 3 : 0
```

*NB.\*b36casemask v-- case mask encoded as base 36 string.*

*NB.*

*NB. This verb must match the python (case\_mask\_encode) function.*

*NB. See the macro (base36\_py) for details.*

*NB.*

*NB. monad: blcl =. b36casemask blclKeys*

*NB.*

*NB. b36casemask <'7ZdVjuN'*

*NB.*

*NB. keys=. <:\_1 ' bKq6rXc 6wpcfgH SCVLN82 6bb47N7 gQhBGBw GSM47GW z78dtXv hH8C2Sz M58pæN7 JvZb6gp '*

*NB. b36casemask keys*

```
c=. b36fd #. 'ABCDEFGHJKLMNOPQRSTUVWXYZ' e.~ > ,y
```

*NB. suppress leading zeroes to match python*

```
c=. ' ' (<(I. '0' = 0 {"1 c);0)} c
```

```
(<"1 c) -.&.> ' '
```

```
)  
  
NB. base 36 from decimal: b36fd 3x^90  
b36fd=: 36x&#. @('0123456789abcdefghijklmnopqrstuvwxyz'&i.)^:_1
```

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

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

```
NB. boxes open nouns  
boxopen=: <^:(L. = 0:)
```

```
changestr=: 4 : 0
```

```
NB.*changestr v-- replaces substrings - see long documentation.  
NB.
```

```
NB. dyad: clReps changestr cl
```

```
NB.
```

```
NB. NB. first character delimits replacements
```

```
NB. '/change/becomes/me/ehh' changestr 'blah blah ...'
```

```
pairs=. 2 {."(1) _2 [\ <; _1 x      NB. change table  
cnt=. _1 [ lim=. # pairs
```

```

while. lim > cnt=.>:cnt do.      NB. process each change pair
  't c'=. cnt { pairs           NB. /target/change
  if. +./b=. t E. y do.         NB. next if no target
    r=. I. b                    NB. target starts
    'l q'=. #&> cnt { pairs      NB. lengths
    p=. r + 0,+/\(<:# r)$ d=. q - 1 NB. change starts
    s=. * d                      NB. reduce < and > to =
    if. s = _1 do.
      b=. 1 #~ # b
      b=. ((1 * # r)$ 1 0 #~ q,l-q) (,r +/ i. l)} b
      y=. b # y
      if. q = 0 do. continue. end. NB. next for deletions
    elseif. s = 1 do.
      y=. y #~ >: d r} b         NB. first target char replicated
    end.
    y=. (c $~ q *# r) (,p +/i. q)} y NB. insert replacements
  end.
end. y                          NB. altered string
)

```

```

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. character table to newline delimited list*

```
ctl=: }.@(@1&(",1)@(-.@(*./\."1@(&' ' @])))) # ,@((10{a.)&(",1)@))
```

*NB. YYYYMMDD to YYYY MM DD - see long document*

```
datefrnum=: 0 100 100&#:@<.
```

*NB. enclose all character lists in blcl in " quotes*

```
dblquote=: '""&,@:(,&'')&.>
```

*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
)
```

*NB. boxes UTF8 names*

```
fboxname=: ([: < 8 u: >) ::]
```

*NB. erase files - cl / blcl of path file names*

```
ferase=: 1!:55 ::(_1:)@(fboxname&>)@boxopen
```

*NB. 1 if file exists 0 otherwise*

```
fexist=: 1:@(1!:4) ::0:@(fboxname&>)@boxopen
```

*NB. format tables as TAB delimited LF terminated text - see long document*

```
fmttd=: [: (] , ((10{a.)"_ = {:) }. (10{a.)"_ ) [: }.@(:,@1&(",1)@(-.@(*./\"1@(&' '@])))) # ,@((10{a.)&(",
>..>1)@])) [: }. "1 [: ;"1 (a.{~9)&,@":&.>
```

```
insqltd=: 4 : 0
```

```
NB.*insqltd v-- insert btcl table into sqlite table.
```

```
NB.
```

```
NB. dyad: iaRc =. baObj insqltd (clSqlTable ;< btclData)
```

```
NB.
```

```
NB. db=. sqlopen_psqlite_ jpath '~temp\dnctest.db'
```

```
NB. dat=. readtd2 'C:\Users\john2000\j64-807-user\temp\dn_dv.txt'
```

```
NB. db insqltd 'dnctest';<dat
```

```
'tab dat'=. y
```

```
st=. sqltables__x ''
```

```
'missing database table' assert st e.~ <tab
```

```
cl=. sqlcols__x tab
```

```
'missing table column(s)' assert cl e.~ 0{dat
```

```
sqlinsert__x tab;(0{dat);< <"1 |: }.dat
```

```
)
```

```
NB. YYYY MM DD lists to YYYYMMDD integers
```

```
intfrdate=: 0 100 100&#. @:<.
```

```
NB. extract drive and path from qualified file names
```

```
justdrvpath=: [: }: ] #~ [: +./\ . '\ '&=
```

```
NB. extracts the extension from qualified file names
```

```
justext=: '"_`([) #~ [: -. [: +./\ . '\ '&=)@.('.'&e.)
```

*NB. file name from fully qualified file names*

```
justfile=: (] #~ [: -. [: +./\ '.'&=)@ (] #~ [: -. [: +./\ . e.&'':\')
```

*NB. kurtosis*

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

*NB. mean value of a list*

```
mean=: +/ % #
```

*NB. median value of a list*

```
median=: -:@(+/@)@((<. , >.)@midpt { /:~) ::_:
```

*NB. mid-point*

```
midpt=: -:@<:@#
```

```
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.
)

```

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

*NB. parse TAB delimited table text - see long document*  
parsetd=: [: <;.\_2&> (a.{~9) ,&.>~ [: <;.\_2 [: (] , ((10{a.)"\_ = {:) }. (10{a.)"\_ ) (13{a.) -.\_ ]

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

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

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

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

*NB. quotes character lists for execution*  
quote=: ' ' '&,@(&' ' ')&(#~ >:@(&' ' '))



*NB. reads a file as a list of bytes*

```
read=: 1!:1&[]`<@.(32&>@{3!:0}))
```

*NB. read TAB delimited table files - faster than (readtd) - see long document*

```
readtd2=: [: <;._2&> (a.{~9) ,&.>~ [: <;._2 [: (] , ((10{a.)"_ = {:) }. (10{a.)"_ (13{a.) -.~ 1!:1&[]`<@.(  
>...>32&>@{3!:0}))
```

```
reb=: 3 : 0
```

*NB.\*reb v-- removes redundant blanks - leading, trailing multiple*

*NB.*

*NB. monad: reb cl*

*NB. dyad: ua reb ul*

```
' ' reb y  
:  
y=. x , y  
b=. x = y  
}.(b*: 1|.b)#y  
)
```

*NB. round (y) to nearest (x) (e.g. 1000 round 12345)*

```
round=: [ * [: (<.) 0.5 + %~
```

*NB. skewness*

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

```
NB. session manager output
smoutput=: 0 0 $ 1!:2&2

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

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

timestamp=: 3 : 0

NB.*timestamp v-- formats timestamp as dd mmm yyyy hr:mn:sc
NB.
NB. monad: cl =. timestamp zu | nlTime
NB.
NB. timestamp '' NB. empty now
NB. timestamp 2007 9 16 NB. fills missing
NB. timestamp 1953 7 2 12 33

if. 0 = #y do. w=. 6!:0'' else. w=. y end.
r=. }: $ w
t=. 2 1 0 3 4 5 {"1 [ _6 [\ , 6 {"1 <. w
d=. '+++::' 2 6 11 14 17 }"1 [ 2 4 5 3 3 3 ": t
mth=. _3[\ ' JanFebMarAprMayJunJulAugSepOctNovDec '
d=. ,((1 {"1 t) {" mth) 3 4 5 }"1 d
d=. '0' (I. d=' ') } d
d=. ' ' (I. d='+') } d
```

```
(r,20) $ d
)
```

*NB. appends trailing line feed character if necessary*

```
tlf=: ] , ((10{a.})"_ = {:) }. (10{a.})"
```

*NB. converts character strings to CRLF delimiter*

```
toCRLF=: 2&}.@:;@:((13{a.}&,&.>@<;.1@((10{a.}&,)@toJ)
```

*NB. converts character strings to host delimiter*

```
toHOST=: toCRLF
```

*NB. converts character strings to J delimiter LF*

```
toJ=: ((10{a.}) I.@(e.&(13{a.}))@]} ]>@:(#~ -.@((13 10{a.})&E.@,))
```

```
today=: 3 : 0
```

*NB.\*today v-- returns todays date.*

*NB.*

*NB. monad: iYYYYMMDD =. today uu*

*NB.*

*NB. today 0 NB. ignores argument*

*NB.*

*NB. dyad: iaYYYYMMDD =. uu today uu*

*NB.*

*NB. 0 today 0*

```
3&{.@(6!:0) ''
:
0 100 100 #. <. 3&{.@(6!:0) ''
)
```

```
todayno=: 3 : 0
```

```
NB.*todayno v-- convert dates to day numbers, converse (todate).
```

```
NB.
```

```
NB. WARNING: valid only for Gregorian dates after and including
```

```
NB. 1800 1 1.
```

```
NB.
```

```
NB. monad: todayno iYYYYMMDD
```

```
NB.
```

```
NB. dates=. 19530702 19520820 20000101 20000229
```

```
NB. todayno 0 100 100 #: dates
```

```
NB.
```

```
NB. dyad: pa todayno itYYYYMMDD
```

```
NB.
```

```
NB. 1 todayno dates
```

```
0 todayno y
```

```
:
```

```
a=. y
```

```
if. x do. a=. 0 100 100 #: a end.
```

```
a=. ((*r=. }: $a) , {:$a) $,a
```

```
'y m d'=. <"_1 |: a
```

```
y=. 0 100 #: y - m <: 2
n=. +/ |: <. 36524.25 365.25 *"1 y
n=. n + <. 0.41 + 0 30.6 #. (12 | m-3),"0 d
0 >. r $ n - 657378
)
```

```
tolower=: 3 : 0
```

*NB.\*tolower v-- convert to lower case.*

*NB.*

*NB. monad: cl =. tolower cl*

```
x=. I. 26 > n=. ((65+i.26){a.) i. t=. ,y
($y) $ ((x{n) { (97+i.26){a.) x}t
)
```

*NB. appends trailing \ character if necessary*

```
tslash=: ] , ('\"_ = {:) }. '\"_
```

*NB. appends trailing / iff last character is not \ or /*

```
tslash2=: ([: - '\\ ' e.~ {:) }. '/' ,~ ]
```

```
valdate=: 3 : 0
```

*NB.\*valdate v-- validates lists or tables of YYYY MM DD Gregorian*

*NB. calendar dates.*

*NB.*

```
NB. monad: valdate il/it
NB.
NB.    valdate 1953 7 2
NB.    valdate 1953 2 29 ,: 1953 2 28 NB. not a leap year

s=. }:$y
'w m d'=. t=. |:((*/s),3)$,y
b=. */(t=<.t),(_1 0 0<t),12>:m
day=. (13|m){0 31 28 31 30 31 30 31 31 30 31 30 31
day=. day+(m=2)*-/0=4 100 400|/w
s$b*d<:day
)

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

NB. day of week - see long document: weekday 1953 7 2
weekday=: 7 | 3 + todayno

weeknumber=: 3 : 0

NB.*weeknumber v-- gives the year and weeknumber of date.
NB.
NB. A week belongs to a year iff 4 days of the week belong to
NB. that year. From J library (dates).
NB.
NB. Note: does not generalize to array arguments.
```

```
NB.  
NB. verbatim: see  
NB.  
NB. http://www.phys.uu.nl/~vgent/calendar/isocalendar.htm  
NB.  
NB. monad: il =. weeknumber ilYYYYMMDD  
NB.  
NB.   weeknumber 2005 1 2  
NB.   weeknumber 1953 7 2  
  
yr=. {.y  
sd=. 1 ((i.~weekday){}) ((<:yr),.12,.29+i.3),yr,.1,.1+i.4  
wk=. >.7%~>: y -&todayno sd  
if. wk >weeksinyear yr do.  
    (>:yr),1  
elseif. wk=0 do.  
    (,weeksinyear)<:yr  
elseif. do.  
    yr,wk  
end.  
)  
  
NB. gives number of weeks in year - see long document  
weeksinyear=: 52 + [: +./"1 [: [ 4 = [: weekday (2 2$1 1 12 31) ,"0 1/~ ]  
  
NB. standardizes path delimiter to windows back \ slash  
winpathsep=: '\&(('/' I.@:= ])} )
```

*NB. writes a list of bytes to file*

```
write=: 1!:2 ]`<@.(32&>@{3!:0))
```

*NB. writes tables as TAB delimited LF terminated text - see long document*

```
writetd2=: ] (1!:2 ]`<@.(32&>@{3!:0)))~ [: ([: (] , ((10{a.)"_ = {:) }. (10{a.)"_ ) [: }.@(@1&(",1)@(-.@(*>.>.>./\"1@(&' 'Q)))) # ,@((10{a.)&(",1)@)) [: }. "1 [: ;"1 (a.{~9)&,@:&.>) [
```

```
yyyymondd=: 3 : 0
```

*NB.\*yyyymondd v-- today in (yyyymondd;hrmnss) format.*

*NB.*

*NB. Yet another date format verb. We can never have enough!*

*NB.*

*NB. monad: (clDate ; clTime) =. yyyymondd uuIgnore*

```
fmt=. 'r<0>2.0'
months=. _3 [\ ' janfebmaraprmayjunjulaugsepoctnovdec'
'yy mn dd'=. 3{.now=. 6!:0''
date=. (":yy),(mn{months),,fmt (8!:2) dd
time=. }. ; ':' ,&.> fmt (8!:0) _3 {. now
date;time
)
```

*NB.POST\_MirrorXref post processor.*

```
smoutput IFACE=: (0 : 0)
```



```
NB. (MirrorXref) interface word(s): 20220714j93913
NB. -----
NB. BuildMirror           NB. backup/create/load mirror
NB. CheckRealDates       NB. check real dates
NB. DumpLocalImageNatural NB. dump (LocalImage) as TAB delimited text
NB. LocalFromDir         NB. local files with directory match (y) and file match (x)
NB. MirrorStatReport     NB. mirror database upload summary report
NB. MissingImagesReport  NB. missing local images report
NB. SetBogusRealDates    NB. set bogus real dates in one real dates file
NB. SuspiciousPairReport NB. suspicious local and online file pairings
)

cocurrent 'base'
coinsert  'MirrorXref'
```

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