

MirrorXref Group

John D. Baker

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

SHA-256: 416c6c663a921231a8796a3a535a5c5f9b40fd8bdf3d215419fd5aea35a95120

June 3, 2024

Contents

MirrorXref Overview	3
MirrorXref Interface	3
Using MirrorXref	3
Processing Metadata	4
MirrorXref Table Schema	6
MirrorXref Code Hints	7
Hint: Creating and Loading <code>mirror.db</code>	7

Hint: MirrorXref SQLite SQL code	7
Hint: J SQLite addon references	8
MirrorXref Source Code	9
=: Index	89

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

BuildMirror	[23]	<i>backup/create/load mirror</i>
CheckRealDates	[25]	<i>check real dates</i>
CreateMirror_sql	[11]	<i>schema of mirror_db database - parsed on ';' character</i>
DumpLocalImageNatural	[29]	<i>dump (LocalImage) as TAB delimited text</i>
FixBogusDates	[31]	<i>patch bogus dates from ThumbsPlus database</i>
LoadMirrorXrefDb	[36]	<i>loads new mirror cross reference database</i>
LocalFromDir	[42]	<i>local files with directory match (y) and file match (x)</i>
MirrorStatReport	[53]	<i>mirror database upload summary report</i>
MissingImagesReport	[55]	<i>missing local images report</i>
SampleMirror	[59]	<i>samples mirror_db</i>
SetBogusRealDates	[60]	<i>set bogus real dates in one real dates file</i>
SuspiciousPairReport	[62]	<i>suspicious local and online file pairings</i>

Using MirrorXref

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 started *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 are 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*.

Processing metadata has always been 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.

Processing Metadata

1. Upload new images to SmugMug.
2. Run the Python 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 session so manual updates are 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 run `SetBogusRealDates.> 0 {"1 CheckRealDates '/real*.txt'` This attempts to fill in bogus real dates with proper dates extracted from the `ThumbsPlus` database. When `SetBogusRealDates` succeeds it returns a file name with a `.txt` extension. If there are date issues a message is shown and the result has a `.fix` extension. Manual checks and adjustments will be needed for any `.fix` files.
10. When `0=#CheckRealDates '/real*.txt'` is 1 all date problems have been resolved.
11. Run the batch file `C:\SmugMirror\Documents\XrefDb\buildmirror.bat`. This batch file backs up the current `mirror.db` file and creates a new one by scanning all the metadata text files in the mirror staging directories. `buildmirror.bat` runs `MirrorXref` in a `jconsole.exe` session.

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 Table Schema

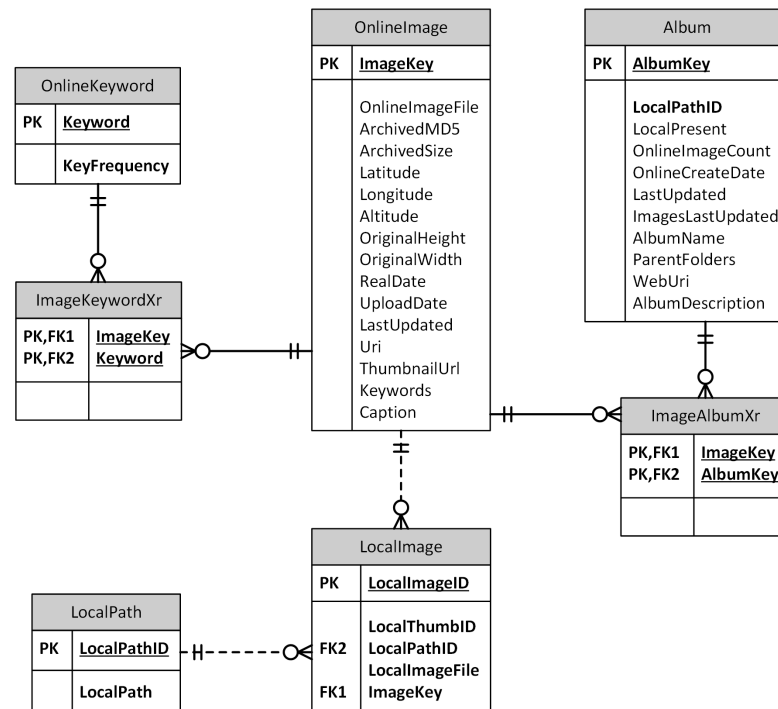


Figure 1: mirror.db table schema: see CreateMirror_sql on page 11.

MirrorXref Code Hints

Every line of inspired and brilliant code is surrounded by hundreds, nay thousands, of dull and inspid ones.

from: "{O}ber Alexander Krike's *magnum opus* — *Correct Coding!*

I *prefer not to wade* through thousands of dull and inspid lines of code. A big part of programming is *managing irrelevance*. By this I mean confining your attention to [the good parts](#). Unfortunately, when unfamiliar code is *dumped* on you, finding the good the parts is challenging. A few hints would help.

The following hints assume you are inspecting MirrorXref [JOD](#) development dictionaries.

NB. load JOD addon - see: <https://code.jsoftware.com/wiki/Addons/general/jod>
`require 'general/jod'`

NB. open required dictionaries - see: <https://github.com/bakerjd99/joddumps>
`od ;:'smugputer utils'`

Hint: Creating and Loading mirror.db

The main MirrorXref verb is [BuildMirror](#) [23]. It calls [LoadMirrorXrefDb](#) [36]. Inspect `LoadMirrorXrefDb`.

Hint: MirrorXref SQLite SQL code

MirrorXref uses the [J SQLite addon](#) to access various SQLite database files. SQLite SQL code is stored as character lists with a `_sql` suffix. See the following:

NB. list SQLite SQL code in MirrorXref

```
([] #~ +./@('_sql'&E.)&>) }. grp 'MirrorXref'
```

This expression produces the *hyperlinked*¹ words:

```
AlbumImageCount_sql    CreateMirror_sql      LocalFile_sql          LocalOnlineFile_sql
MissingLocalFiles_sql  UnClickHereImages_sql UpdateLocalPresent_sql UploadRateCount_sql
```

Hint: J SQLite addon references

J SQLite addon verbs are consistently named and can be easily found with the JOD regular expression command:

NB. search for sqlite addon references in MirrorXref

```
'sql[[:alpha:]]+__' rxs }. grp 'MirrorXref'
```

When you run this search, and extract the SQLite references, you will see that MirrorXref *only* uses the addon verbs.

```
sqlclose  sqlcmd  sqldict  sqlinsert sqlparm  sqlread  sqlreads  sqlsize  sqltables
```

And, all SQLite references can be found in these words.

```
BracketOverlaps    CreateMirrorXrefDb    DumpLocalImageNatural IsotimeFromThumbID    LoadAlbum
LoadImageAlbumXr    LoadImageKeywordXr    LoadLocalPath          LoadOnlineImage         LoadOnlineKeyword
LocalFrOnline        LocalFromDir           MatchManual             MatchOnlineLocal        MatchOnlineNoBrackets
MissingImagesReport  NonEmptyGalleryStats  SampleMirror            SuspiciousPairReport    TableCounts
ThumbIDFromImageKey  UpdateLocalPresent     WeekUploadRates         fsd                      insqltd
```

¹Use the index if you are reading a paper version of this document.

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. https://github.com/bakerjd99/jacks/tree/master/mirrorxref
NB.
NB. interface word(s):
NB. -----
NB. BuildMirror          - backup/create/load mirror
NB. CheckRealDates      - check real dates
NB. CreateMirror_sql     - schema of mirror_db database - parsed on ';' character
NB. DumpLocalImageNatural - dump (LocalImage) as TAB delimited text
NB. FixBogusDates        - patch bogus dates from ThumbsPlus database
NB. LoadMirrorXrefDb    - loads new mirror cross reference database
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. *SampleMirror* - samples mirror_db
NB. *SetBogusRealDates* - set bogus real dates in one real dates file
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*
NB. *22jul29 (RenameRealDates) added*
NB. *22jul31 (SampleMirror) added*

NB. 22dec24 (FixBogusDates) added

NB. 23may27 (CreateMirrorXrefDb) (for_create.) to (for_crtsql.) 9.5 beta clash

```
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 CreateMirror_sql DumpLocalImageNatural FixBogusDa
```

```
>..>tes LoadMirrorXrefDb LocalFromDir MirrorStatReport MissingImagesReport SampleMirror SetBogusRealDates Susp  
>..>iciousPairReport'
```

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

```
MANLOCXREF=: '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=: '0.9.8';11;'03 Jun 2024 14:43:52'

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 ' Divisible FixBogusDates IFACEWORDSMirrorXref LocalFromDir MACROSMirrorXref MI
>..>RRORVMD ROOTWORDSMirrorXref SampleMirror 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=. mantxtf=. sustxtf=. badtxtf=. uprtxtf=. ''
```

```
if. fexist source,LOCOXREF do. txtxf=. read source,LOCOXREF end.
```

```
if. fexist source,MANLOCOXREF do. mantxtf=. read source,MANLOCOXREF end.
```

```
if. fexist source,SUSPECTPAIRS do. sustxtf=. read source,SUSPECTPAIRS end.
```

```
if. fexist source,BADGALCNTS do. badtxtf=. read source,BADGALCNTS end.
```

```
if. fexist source,UPRATESUM do. uprtxtf=. 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=. (intfrdate 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 [ ferase y [ sqlreset_psqli_ ''
```

```
NB. create tables - NOTE: cannot use (create) in for_create. j 9.5 beta
for_crtsql. sql do.
  crtsql=. ;crtsql
  ('unable to create table ->',crtsql) assert 0 = sqlcmd__dt crtsql
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
```

)

FixBogusDates=: 3 : 0

*NB.*FixBogusDates v-- patch bogus dates from ThumbsPlus database.*

NB.

NB. monad: FixBogusDates uuIgnore

BuildMirror 2

,. SetBogusRealDates&.> 0 {"1 CheckRealDates '/real*.txt'

)

IsotimeFromThumbID=: 3 : 0

*NB.*IsotimeFromThumbID v-- iso taken times from thumbs ids.*

NB.

NB. monad: bl =. IsotimeFromThumbID ilThumbID

NB. sqlite addon !()=. sqlopen_psqliite_ sqlread__db sqlclose__db*

db=. sqlopen_psqliite_ 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_psqli_ trg
dat=. sqldict__dt 'LocalPath'

NB. match ainfo paths with local path table
(0 {"1 dat)=. 1 {"1 dat
```


33 June 3, 2024

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_sqlite_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_sqlite_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:/thumbsdbs/primary2018.tpdb8s' NB. thumbsplus db
NB.   trg=. 'c:/smugmirror/documents/xrefdb/mirror.db' NB. mirror db
NB.   dmp=. 'c:/smugmirror/documents/xrefdb/locoxref.txt' NB. online local pairs
NB.   mcf=. 'c:/smugmirror/documents/xrefdb/manlocoxref.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_sqlite_ 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_psqliTE 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/manlocoreref.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_sqlite_ 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_sqlite_ 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

```
(0{"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_psqliite_ src
dt=. sqlopen_psqliite_ 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:/thumbsdb/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&.> rdfs
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_psqli_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_psqli_sqldict__dt sqlclose__dt*

```
dt=. sqlopen_psqli_y
```

```
d=. sqldict__dt AlbumImageCount_sql
```

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

```
dstat ImageCnt [ sqlclose__dt ''
```

```
)
```

NotDivisible=: 3 : 0

*NB.*NotDivisible v-- album image counts not 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 -.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
)
```

```
RenameRealDates=: 3 : 0
```

```
NB.*RenameRealDates v-- renames fix/old/txt realdate files.
```

```
NB.
```

```
NB. monad: clFile =. RenameRealDates clFullPathFixFile
```

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

```
NB. erase files with old extension
```

```
old=. 1 dir '*.old' ,~ tslash2 jpathsep justpath winpathsep y
ferase old
```

```
NB. rename current real date file to old
rdf=. '.txt' ,~ (-#'.fix') }. y
('missing real date file - > ',rdf) assert fexist rdf
(read rdf) write '.old' ,~ (-#'.fix') }. y
ferase rdf
```

```
NB. rename fix file to txt
(read y) write rdf
ferase y
('missing real date file - > ',rdf) assert fexist rdf
rdf
)
```

```
SampleMirror=: 3 : 0
```

```
NB.*SampleMirror v-- samples mirror_db.
NB.
NB. monad: SampleMirror cIMirrorCopy
NB.
NB. NB. copy mirror.db to small_mirror.db
NB. df=. jpath '~addons/jacks/testdata/small_mirror.db'
NB. SampleMirror df
NB.
NB. dyad: iaN SampleMirror cIMirrorCopy
```

```
500 SampleMirror y
:
```

```
NB. require 'data/sqlite' !(*)=. sqlopen_psqlite_ sqlread__db sqlclose__db
db=. sqlopen_psqlite_ y

NB. randomly select (x) images !(*)=. ImageKey
(;{. r)=. ;{:r=. sqlread__db 'select ImageKey from OnlineImage'
if. x < #ImageKey do.
  sk=. ImageKey {~ x ? #ImageKey
  sk=. '(' ,({. ;',' ,&.> dblquote sk),')'

  NB. remove all but sample images from related tables - deletion order matters
  msg=. 'deletion error -> '
  (msg,'LocalImage') assert -.sqlcmd__db 'delete from LocalImage where ImageKey not in ',sk
  (msg,'ImageKeywordXr') assert -.sqlcmd__db 'delete from ImageKeywordXr where ImageKey not in ',sk
  (msg,'ImageAlbumXr') assert -.sqlcmd__db 'delete from ImageAlbumXr where ImageKey not in ',sk
  (msg,'OnlineImage') assert -.sqlcmd__db 'delete from OnlineImage where ImageKey not in ',sk

  NB. recover space
  'vacuum error' assert -.sqlcmd__db 'vacuum'
else.
  smoutput 'sample size to large for db'
end.
sqlclose__db ''
)

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: clFile =. 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'  
NB.  
NB. NB. 1 if all dates properly set  
NB. 0 = #CheckRealDates '/real*.txt'  
  
'okdt t'=. ThumbsRealDates y  
  
if. #t 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'
(toHOST fmttd s) write f

NB. rename realdates files when no date issues
if. okdt do. RenameRealDates f
else.
  f [ smoutput 'date issues inspect ->';y
end.

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 (manlocorexref.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_psqli_ sqlread__db sqlclose__db
db=. sqlopen_psqli_ 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: (paOkdate ; btcl) =. ThumbsRealDates clFileRealDates
NB.
```

```
NB.  p=. 'c:/smugmirror/mirror/Other/DirectCellUploads/'
NB.  f=. p, 'realdate-DirectCellUploads-RMWQ6K-1p.txt'
NB.  ThumbsRealDates f

NB. assume dates ok
nodates=. 0 2$a: [ okdt=.1

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.
    okdt=. 0 NB. date problems
    smoutput 'WARNING: missing thumbsplus taken times ->';y
    if. (#taken_time_iso) = +/b do.
      smoutput 'WARNING: all thumbsplus taken times missing ->';y
      okdt;<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=. d #~ 0 < #&> 1 {"1 d
if. #d do. okdt;<(:, 'ImageKey RealDate') , d else. okdt;<nodates end.
else.
  okdt;<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_sqlite_ 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_psqli_t_ sqldict__dt sqlclose__dt
```

```
NB. get uploads per year and images per year - sorted on year
```

```
dt=. sqlopen_psqli_t_ 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

```
allwhitetrim=: ] #~ [: -. [: (*./\ . +. */.\) ] 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 z78dtXu hH8C2Sz M58pxN7 JuZb6gp'
NB.   b36casemask keys

c=. b36fd #. 'ABCDEFGHIJKLMNOPQRSTUVWXYZ' 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=. ((l * # 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)&,@":&.>
```

```
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
)*

```
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\dntest.db'  
NB.  dat=. readtd2 'C:\Users\john2000\j64-807-user\temp\dn_dv.txt'  
NB.  db insqltd 'dntest';<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. standarizes J path delimiter to unix/linux forward slash  
jpathsep=: '/'&(('\ ' I.@:= ]))
```

```
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. extracts only the path from qualified file names

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

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.

```
(".;(0=nc <'SHOWSMO_ijod_'){'1';'SHOWSMO_ijod_') smoutput IFACE_MirrorXref=: (0 : 0)
```

```
NB. (MirrorXref) interface word(s): 20240603j144352
NB. -----
NB. BuildMirror           NB. backup/create/load mirror
NB. CheckRealDates       NB. check real dates
NB. CreateMirror_sql      NB. schema of mirror_db database - parsed on ';' character
NB. DumpLocalImageNatural NB. dump (LocalImage) as TAB delimited text
NB. FixBogusDates         NB. patch bogus dates from ThumbsPlus database
NB. LoadMirrorXrefDb      NB. loads new mirror cross reference database
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. SampleMirror          NB. samples mirror_db
NB. SetBogusRealDates     NB. set bogus real dates in one real dates file
NB. SuspiciousPairReport  NB. suspicious local and online file pairings

    FixBogusDates 0 NB. run to patch dates
)

cocurrent 'base'
coinset  'MirrorXref'
```


Index

afterlaststr, 70
afterstr, 70
AlbumImageCount, 18
AlbumImageCount_sql, 15
alltrim, 70
allwhitetrim, 70
antimode, 71
assert, 71

b36casemask, 71
b36fd, 72
BackUpMirrorXrefDb, 18
BADGALCNTS, 15
beforelaststr, 72
beforestr, 72
BOGUSMARKDATE, 15
BogusRealDates, 22
boxopen, 72
BracketOverlaps, 23
BuildMirror, 23

changestr, 73
charsub, 74
CheckRealDates, 25
CR, 15
CreateMirror_sql, 11
CreateMirrorXrefDb, 27

ctl, 74

datefrnum, 74
dblquote, 74
dev, 74
Divisible, 28
dstat, 75
DumpLocalImageNatural, 29

fboxname, 75
ferase, 75
fexist, 76
FixBogusDates, 31
fmttd, 76
fsd, 76

IFACE_MirrorXref, 87
IFACEWORDSMirrorXref, 15
insqltd, 76
intfrdate, 77
IsotimeFromThumbID, 31

jpathsep, 77
justdrvpath, 77
justext, 77
justfile, 77
justpath, 78

kurtosis, 78

LF, 16
LoadAlbum, 31
LoadImageAlbumXr, 34
LoadImageKeywordXr, 34
LoadLocalPath, 35
LoadMirrorXrefDb, 36
LoadOnlineImage, 39
LoadOnlineKeyword, 39
LocalFile_sql, 14
LocalFromDir, 42
LocalFrOnline, 40
LocalOnlineFile_sql, 14
LOCOMISS, 16
LOCOXREF, 16

MACROSMirrorXref, 16
MANLOCOXREF, 16
MatchManual, 42
MatchOnlineLocal, 45
MatchOnlineNoBrackets, 48
mean, 78
median, 78
midpt, 78
MIRRORDB, 16
MIRRORDBPATH, 16

MIRRORDBTEMP, 16
MIRRORHEAD, 17
MirrorImageXrTables, 51
MIRRORPATH, 17
MirrorStatReport, 53
MIRRORVMD, 17
MissingImagesReport, 55
MissingLocalFiles_sql, 14
mode2, 78

NonEmptyGalleryStats, 56
NotDivisible, 56

ofreq, 79

parsetd, 79
portchars, 79
PRIMARYTEST, 17
PRIMARYTHUMBS, 17
pwcfc, 79

q1, 79
q3, 79
quote, 79

read, 80
readtd2, 80
RealDateFrManifest, 58
reb, 80
RenameRealDates, 58
ROOTWORDSMirrorXref, 17
round, 80

SampleMirror, 59
SetBogusRealDates, 60
skewness, 80
smoutput, 81
ssdev, 81
stddev, 81
SUSPECTPAIRS, 17
SuspiciousPairReport, 62

TableCounts, 64
ThumbIDFromImageKey, 64
ThumbsRealDates, 65
timestamp, 81
tlf, 82
toCRLF, 82
today, 82

todayno, 83
toHOST, 82
toJ, 82
tolower, 84
tslash, 84
tslash2, 84

UnClickHereImages_sql, 15
UpdateLocalPresent, 67
UpdateLocalPresent_sql, 14
UploadRateCount_sql, 18
UPRATESUM, 17

valdate, 84
var, 85

weekday, 85
weeknumber, 85
weeksinyear, 86
WeekUploadRates, 69
winpathsep, 86
write, 87
writetd2, 87

yyymondd, 87