

1.0.1 JOD Source Code

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jodon Source Code

*NB.*jodon s-- places (jodon) and (jodoff) in z locale.*

cocurrent 'z'

*NB.*end-header*

jodoff=: 3 : 0

*NB.*jodoff v-- turns JOD off result is 1 if successful and 0
NB. otherwise.*

NB.

*NB. Destroys dictionary objects, clears JOD classes and drops the
NB. (ijod) interface. This verb plus (jodon) and (jodsystempath)
NB. remain in the (z) locale after off'ing JOD and can be used to
NB. reload the system.*

NB.

NB. monad: jodoff uuIgnore

NB. HARDCODE: JODobj_ijod_ ajod ijod base

try.

jo=. <'JODobj_ijod_'

if. 0 = (4!:0) jo do. (4!:55) jo [(18!:55) destroyjod__JODobj 0 end.

NB. erase jod classes

(18!:55) w #~ 'ajod'&-:@:(4&{.)&> w=. 18!:1] 0

```
NB. erase (ijod) interface and clear base path
((18!:2<'base')-<'ijod') 18!:2 <'base'
(18!:55)<'ijod'

_1=(4!:0) jo
catchd.
  0
end.
)

jodon=: 3 : 0

NB.*jodon v-- turn JOD on result is 1 if successful and 0
NB. otherwise.
NB.
NB. Tests the current J environment and creates or activates JOD
NB. objects.
NB.
NB. monad: paRc =. jodon uuIgnore

NB. format of (9!:14) has changed without warning in the past
jvn=. 9!:14 ''

NB. first value before '/' is the version number (we hope).
jvn=. , (jvn i. '/') {. jvn
if. #jvn do. jvn=. 0 ". jvn #~ jvn e. '0123456789' else. jvn=. 0 end.
```

```
sp=. ] [ 1!:2&2
if. jvn < 602 do.
  msg=. 'JOD requires J 6.02 or later.'
  msg=. msg,LF, 'J is freely available at www.jsoftware.com'
  0 [ sp msg,LF, 'Download and install J 6.0x-8.0x and then reinstall JOD.'
  return.
end.

nc=. (4!:0)@<
ex=. (4!:55)@<

NB. spot check of J environment - we need core J utilities
NB. if the following are not present JOD will not work
if. _1 e. (4!:0);:'load conew coclass coerase coinsert cocurrent copath jpath UNAME IFWIN' do.
  msg=. 'JOD depends on core J load and class utilities.'
  0 [ sp msg=. msg,LF,'Load J with a standard profile to use JOD.'
  return.
end.

NB. HARDCODE: JODobj_ijod_ ijod ajod
jodobj=. nc 'JODobj_ijod_' NB. name class of JOD object pointer
jodco=. (<'ajod') e. 18!:1 ] 0 NB. JOD class status

if. (0=jodobj) *. jodco do. 1 NB. JOD is loaded
elseif. (_1=jodobj) *. jodco do.
  NB. jod is off and classes are loaded - create objects !(*)=. conew
  JODobj_ijod_=: conew 'ajod'
```

```
    if. jodcs=. createjod__JODobj JODobj_ijod_ do. 1 else. 0 [ ex 'JODobj_ijod_' end.  
elseif. -. jodco do.  
    NB. JOD classes absent load and start system !(*)=. load  
    ex 'JODobj_ijod_'  
    NB. JOD load now requires addon path  
    load 'general/jod'  
    0 = nc 'JODobj_ijod_'  
elseif.do. 0 NB. utterly screwed up system state  
end.  
)
```

jod Source Code

*NB. *jod c-- main JOD dictionary class.*
NB.
NB. All other dictionary classes are extensions of the dictionary class.
NB. They all use standard constants and verbs defined in this class.
NB.
NB. Creating a JOD object defines a (ijod) locale interface.
NB. Destroying a JOD object erases the (ijod) locale interface.
NB.
NB. Contains: dictionary utilities, constants, interface verbs
NB.
NB. Interface: (verbs made available by ijod locale)
NB. bget get objects from put dictionary backups
NB. bnl backup name lists from patterns
NB. del delete words, tests, groups, macros, et cetera
NB. did dictionary identification
NB. dnl dictionary name lists from patterns
NB. dpset sets dictionary parameters
NB. gdeps list group and suite dependents
NB. get get words, tests, macros, et cetera from dictionary
NB. globs word and test global name references
NB. grp create and query groups and suites
NB. make generate J scripts and database dumps
NB. mnl many dictionary name lists from patterns
NB. newd create new dictionary
NB. od opens and closes dictionaries

NB. packd pack dictionaries
NB. put put words, tests, macros, et cetera into dictionary
NB. regd register/unregister a dictionary
NB. restd restore last backup created by (packd)
NB. rxs regular expression search
NB. uses words used by words and tests
NB.
NB. Notes:
NB. Error messages (JOD errors 000-049)

```
coclass 'ajod'  
coinert 'ijod'
```

NB. task addon loaded first for J 9.01

```
require 'jfiles regex'
```

*NB.*dependents x-- words defined in this section have related definitions*

NB. host specific z locale nouns set during J profile loading
NB. ()=: IFWIN UNAME IFIOS*

NB. line feed, carriage return, tab and line ends

```
LF=: 10{a.  
CR=: 13{a.  
TAB=: 9{a.  
CRLF=: CR,LF
```

NB. macro script option codes - to add more add a new object code

NB. and modify the following definition of MACROTYPE

JSCRIPT=: 21

LATEX=: 22

HTML=: 23

XML=: 24

TEXT=: 25

BYTE=: 26

MARKDOWN=: 27

UTF8=: 28

PYTHON=: 29

SQL=: 30

JSON=: 31

NB. macro text types

MACROTYPE=: JSCRIPT,LATEX,HTML,XML,TEXT,BYTE,MARKDOWN,UTF8,PYTHON,SQL,JSON

NB. object codes

WORD=: 0

TEST=: 1

GROUP=: 2

SUITE=: 3

MACRO=: 4

NB. dictionary self reference

DICTIONARY=: 5

NB. object name class, depends: WORD,TEST,GROUP,SUITE,MACRO

OBJECTNC=: WORD,TEST,GROUP,SUITE,MACRO

NB. bad object code, depends: OBJECTNC

badobj=: [: -. [: *./ [: ,] e. OBJECTNC"_

NB. path delimiter character & path punctuation characters

PATHDEL=: IFWIN { '/'\

PATHCHRS=: ' :.-',PATHDEL

NB. path verbs - embed /\ chars depending on host OS

hostsep=: (IFWIN{'/\'}&(((IFWIN{'\/'}) I.@:=]))

NB. extracts only the path from qualified file names

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

NB. default master profile user locations

NB. jodsystempath is left global here as this

NB. verb is defined in jodon.ijs

JMASTER=: jodsystempath 'jmaster'

JODPROF=: jodsystempath 'jodprofile.ijs'

JODUSER=: jodsystempath 'joduserconfig.ijs'

*NB.*enddependents*

*NB.*end-header*

NB. valid characters in file and path names

ALPHA=: 'ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789'

NB. master file cn: dictionary number log - see long documentation

CNMFDLOG=: 10

NB. master file cn: in use bit

CNMFMARK=: 0

NB. master file cn: dictionary parameter defaults

CNMFPARMDEFS=: 9

NB. master file cn: dictionary parameters - see long documentation

CNMFPARMS=: 7

NB. master file cn: main dictionary table - see long documentation

CNMFTAB=: 2

NB. master file cn: main dictionary table backup

CNMFTABBCK=: 3

NB. default option code

DEFAULT=: 7

NB. comment tag marking end of dependents section

DEPENDENTSEND=: 'enddependents'

NB. comment tag marking start of dependents section

DEPENDENTSSTART=: 'dependents'

NB. numeral characters

DIGITS=: '0123456789'

NB. document option code

DOCUMENT=: 9

NB. controls dependent block processing - (1) process (0) do not process

DODEPENDENTS=: 1

NB. dictionary path table - see long documentation

DPATH=: 0 4\$00

NB. maximum dictionary path length

DPLIMIT=: 32

ERR001=: 'invalid option(s)'

ERR002=: 'invalid name(s)'

ERR003=: 'name(s) to long'

ERR004=: 'invalid or missing locale'

ERR005=: 'invalid or missing dictionary name(s)'
ERR006=: 'cannot read master'
ERR007=: 'cannot read master documentation'
ERR008=: 'invalid names(s) - embedded locale references'
ERR009=: 'no documentation text for ->'
ERR010=: 'invalid name pattern(s)'
ERR011=: 'error(s) creating dictionary master file'
ERR012=: 'master in use - wait or try (dpset)'
ERR013=: 'cannot mark master'
ERR014=: 'invalid name and text'
ERR015=: 'invalid name, class and text'
ERR016=: 'definition failure among ->'
ERR017=: 'jfile replace error'

ERR018=: 'dictionary in use - cannot unregister'

ERR019=: 'invalid parameter or value'

ERR020=: 'table name(s) are not unique'

ERR021=: 'dll error generating GUID'

ERR022=: 'JOD z interface clashes with current z locale names. JOD load aborted'

ERR023=: 'white space preservation is off - turn on to put'

ERR024=: 'dependent section unbalanced'

ERR025=: 'only one balanced dependent section allowed'

ERR026=: 'error in joduserconfig.ijs - last J error ->'

ERR027=: 'unable to set master parameters ->'

ERR028=: 'not supported on this environment ->'

NB. explain option code

EXPLAIN=: 8

NB. space in bytes required to create dictionary (0 turns off volume sizing)

FREESPACE=: 0

NB. group and suite header code

HEADER=: 1

NB. database file extension (it's changed in the past)

IJF=: '.ijf'

NB. J script file extension

IJS=: '.ijs'

NB. inverted data code: name classes and macro types

INCLASS=: 12

NB. inverted data code: object creation time

INCREATE=: 13

NB. inverted data code: last object put time

INPUT=: 14

NB. inverted data code: object size in bytes

INSIZE=: 15

NB. core JOD interface - loaded into (ijod) - see (setjodinterface)

IzJODinterface=: < ; _1 ' bnl bget del did dnl dpset gdeps get globs grp make mnl newd od packd put regd res
>...> td rxs uses'

NB. standard dictionary file names - order matters

JDFILES=: <;._1 ' jwords jtests jgroups jsuites jmacros juses'

NB. standard dictionary subdirectory names - order matters

JDSDIRS=: <;._1 ' script suite document dump alien backup'

NB. default JOD user directory

JJODDIR=: 'joddicts\'

NB. regular expression matching valid J names

JNAME=: '[[[:alpha:]][:alnum:]]_]*'

NB. version, make and date

JODVMD=: '1.0.1';7;'28 Mar 2020 13:01:05'

NB. base J version - prior versions not supported by JOD

JVERSION=: ,6.0199999999999996

NB. default master file parameters

MASTERPARMS=: 6 3\$'PUTFACTOR';'(+integer) words stored in one loop pass';100;'GETFACTOR';'(+integer) words
>...> retrieved in one loop pass (<2048)';250;'COPYFACTOR';'(+integer) components copied in one loop pass';100;'>...> DUMPFATOR';'(+integer) objects dumped in one loop pass (<240)';50;'DOCUMENTWIDTH';'(+integer) width of ju>...> stified document text';61;'WWWBROWSER';'(character) browser command line - used for jod help';' "C:\Progra>...>m Files\Internet Explorer\IEXPLORE.EXE"'

NB. maximum length of short explanation text

MAXEXPLAIN=: 80

NB. maximum length of dictionary names

MAXNAME=: 128

NB. (name,[class],value) option code

NVTABLE=: 10

NB. successful return

OK=: 1;1

OK001=: 'dictionary unregistered ->'

OK002=: ' is a noun - no references'

OK003=: 'defaults restored for ->'

OK004=: 'master file reset'

OK005=: 'path cleared ->'

OK006=: 'parameter set ->'

OK007=: 'put dictionary is now a read/only library ->'

OK008=: 'put dictionary read/write status restored ->'

OK009=: 'put dictionary references deleted ->'

NB. indexes of dictionary subdirectories in dictionary parameter list

PARMDIRS=: 4 5 6 7 8 9

NB. parameter file - extension is required

PARMFILE=: 'jodparms.ijs'

NB. displayed path delimiter character

PATHSHOWDEL=: '/'

NB. search pattern option codes

PATOPS=: 1 2 3 _1 _2 _3

NB. controls whether words are saved when whitespace is discarded

PUTBLACK=: 0

NB. reference option code

REFERENCE=: 11

NB. maximum number of words per locale

SYMBOLLIM=: 2048

NB. uses union option code

UNION=: 31

NB. retains string after first occurrence of (x)

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

NB. trims all leading and trailing blanks

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

NB. test for jfile append errors

```
badappend=: 0: > {.
```

```
badblia=: 4 : 0
```

*NB.*badblia v-- returns 0 if (y) is a boxed list of integer atoms*

NB. or singleton codes from (x)

```
if. _1 -: dat=. , (; :: _1:) y do. 1
elseif. (#y) ~: #dat do. 1
elseif. badil dat do. 1
elseif.do. -. */ dat e. x
end.
)
```

NB. 1 if (y) is not boxed

```
badbu=: [: 32&~: 3!:0
```

NB. 1 if (y) is not a character list or atom

```
badcl=: -.@ (2&=@ (3!:0)) +. 1: < [: # $
```

NB. 1 if (y) is not floating

badfl=: [: -. 8"_ = 3!:0

NB. 1 if (y) is not a list of non-extended integers

badil=: -.@((([: # \$) e. 0 1"_) *. 3!:0 e. 1 4"_)

NB. bad jfile operation

badjr=: [: +./ _1 _2&e.

NB. bad locale name

badlocn=: [>: [: 18!:0 ::(_2:) [: <]

NB. bad return code

badrc=: [: -. 1: -: [: > {.

NB. test for jfile replacement errors

badreps=: 0: > <./

NB. 1 if any of shape, type or sign differ

badsts=: 0:

NB. 1 if items are not unique 0 otherwise

badunique=: # ~: [: # ~.

NB. retains string before first occurrence of (x)

beforestr=:] {~ 1&(i.~)@([E.])

bget=: 3 : 0

*NB.*bget v-- retrieves objects from put dictionary backups.*

NB.

NB. (bget) implements a subset of (get). (bget) fetches objects

NB. from either the last backup or particular backups.

NB.

NB. OBJECTS ARE NOT DEFINED IN LOCALES for the simple reason that

NB. backup fetches may return many versions of the same object.

NB.

NB. Only put dictionary backups are searched there is no backup

NB. path. Also, there is no corresponding (bput) because the

NB. files read by (bget) are backups that, once created, are

NB. never altered by JOD.

NB.

NB. Also, certain objects are not fetched, name classes,

NB. timestamps and sizes.

NB.

NB. monad: bget cl/blcl

NB.

NB. NB. get last word backup

NB. bget 'oops'

NB.

NB. NB. collect from most current backup

NB. bget ;: 'shawn of the dead'

NB.

NB. NB. collect objects from particular put dictionary backups

```
NB.  bget <;._1 ' us.12 poor.10 little.08 words.08 lastback'
NB.
NB.  NB. get many versions of a word
NB.  bget <;._1 ' me.12 me.09 me.08 me.02'
NB.
NB. dyad:  ilCodes bget cl/bluu
NB.
NB.  5 bget ''      NB. dictionary document from last backup
NB.  5 bget '.12'   NB. dictionary document from particular backup
NB.  5 bget }. bnl '.' NB. dictionary document versions in all backups
NB.
NB.  NB. get a suite header from particular backup
NB.  3 bget 'sweet.04'
NB.
NB.  NB. get long documents of an object
NB.  2 9 bget <;._1 ' gfoo.12 gfoo.05 gfoo.00'
NB.
NB.  NB. all short explanations of words in last backup
NB.  0 8 get }. revo ''
NB.
NB.  NB. three versions of a group's header - similar to (get) where
NB.  NB. (2 get 'group') returns the group header
NB.  2  bget <;._1 ' gfoo.12 gfoo.05 gfoo.00'
NB.
NB.  2 1 bget <;._1 ' gfoo.12 gfoo.05 gfoo.00' NB. three versions of a group's word list
```

WORD bget y

```
:
msg=. ERR001

if. (2<#x) +. badil x do. jderr msg return. end.

NB. do we have a dictionary open?
if. badrc uv=. checkopen__ST 0 do. uv return. end.

NB. are backups present?
if. badrc uv=. checkback__ST {:0{DPATH__ST do. uv return. else. bn=. rv uv end.

NB. format standard (x) options
x=. x , (-2-#x) {. DEFAULT

NB. are backup names and numbers valid?
if. badrc bnm=. (({.x),bn) bchecknames__ST ,boxopen y do. bnm return. else. bnm=. rv bnm end.

select. {. x
case. WORD do.
  select. second x
    case. DEFAULT do. (WORD,0) bgetobjects__ST bnm
    case. EXPLAIN do. WORD bgetexplain__ST bnm
    case. DOCUMENT do. (WORD,1) bgetobjects__ST bnm
    case.do. jderr msg
  end.
case. TEST do.
  select. second x
```

```
    case. DEFAULT do. (TEST,0) bgetobjects__ST bnm
    case. EXPLAIN do. TEST bgetexplain__ST bnm
    case. DOCUMENT do. (TEST,1) bgetobjects__ST bnm
    case.do. jderr msg
end.
case. GROUP do.
  select. second x
    case. HEADER do. (GROUP,2) bgetobjects__ST bnm
    case. DEFAULT do. GROUP bgetgstext__ST bnm
    case. EXPLAIN do. GROUP bgetexplain__ST bnm
    case. DOCUMENT do. (GROUP,1) bgetobjects__ST bnm
    case.do. jderr msg
end.
case. SUITE do.
  select. second x
    case. HEADER do. (SUITE,2) bgetobjects__ST bnm
    case. DEFAULT do. SUITE bgetgstext__ST bnm
    case. EXPLAIN do. SUITE bgetexplain__ST bnm
    case. DOCUMENT do. (SUITE,1) bgetobjects__ST bnm
    case.do. jderr msg
end.
case. MACRO do.
  select. second x
    case. DEFAULT do. (MACRO,0) bgetobjects__ST bnm
    case. EXPLAIN do. MACRO bgetexplain__ST bnm
    case. DOCUMENT do. (MACRO,1) bgetobjects__ST bnm
    case.do. jderr msg
```

```
end.  
case. DICTIONARY do.  
  select. second x  
    case. DEFAULT do. bgetdicdoc__ST bnm  
      case.do. jderr msg  
    end.  
  case.do. jderr msg  
end.  
)
```

```
bnl=: 3 : 0
```

*NB.*bnl v-- list objects in put dictionary database backup files.*

NB.

NB. monad: dnl clStr / zlStr

NB.

NB. bnl '' NB. list all words in last backup

NB. bnl '.' NB. list backup suffixes

NB. bnl 'pfx' NB. list all words in last backup starting with 'pfx'

NB. bnl 're.12' NB. list all words in backup 12 starting with 're'

NB.

NB. dyad: ilCodes bnl clStr / zlStr

NB.

NB. 4 2 bnl 'ex' NB. macros with names containing 'ex' in last backup

NB. 2 3 bnl 'et.13' NB. groups with names ending with 'et' in backup 13

NB.

NB. 14 bnl '.' NB. display pack/backup dates


```
WORD bnl y
:
if. badrc msg=.x nlargs y do. msg return. end.

NB. format standard (bnl) (x) options and search
x=. x , (<:#x)}. 1 , DEFAULT

NB. special list backup dates case first
if. (INPUT=0{x) *. (,NDOT__ST)-:alltrim y do. x bnlsearch__ST y return. end.

if. ((0{x) e. WORD,MACRO) *. -(2{x) e. DEFAULT,MACROTYPE,i. 4 do. jderr ERR001
elseif. ({. x) e. OBJECTNC do. x bnlsearch__ST y
elseif.do. jderr ERR001
end.
)

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

catrefs=: 3 : 0

NB.*catrefs v-- split into nonlocale and locale names.
NB.
NB. monad: catrefs blcl

if. (,a:)-:,y do. ''
else.
```

```

r=. islocref&> y  NB. insure 2 item result
s=. <(-.r) # y
l=. <r # y
s,l
end.
)

```

```

NB. call dll
cd=: 15!: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
)

```

```
checknames=: 3 : 0
```

```

NB.*checknames v-- tests alleged boxed lists of J names. Accepts
NB. all valid J names. When (x=:1) names with embedded locale
NB. references are rejected otherwise embedded locales are
NB. accepted.

```

```
NB.
```

```
NB. monad: checknames cl/blcl
```

```
NB.
```

```
NB. checknames 'we';'check';'out'
```

```
NB.
```

```
NB. dyad: pa checknames cl/blcl
```

```
NB.
```

```
NB. 0 checknames ;:'accept our_poor_ locale__NAMES'
```

```
1 checknames y
:
msg=. ERR002  NB. errmsg: invalid name(s)
if. 1<#$ y      do. jderr msg return. end.
y=. ,&.> boxopen y  NB. allow char lists
if. +./ badcl&> y do. jderr msg return. end.

if. x do.
  NB. restrict embedded locales
  msg2=. ERR008  NB. errmsg: invalid names(s) - embedded locale references
  if. ' _ ' e. , _1&{.&> y do. jderr msg2 return. end.
  if. +./ +./@:( ' _ ' &E.)&> y do. jderr msg2 return. end.
  if. _2 e. nc y      do. jderr msg return. end.
else.
  NB. permit embedded locales - test must eschew class tests
  NB. to avoid evaluation of indirect locale references
  if. (#jnfrblcl y)~:#y do. jderr msg return. end.
end.

if. MAXNAME < >./ #&> y do. jderr ERR003 return. end. NB. errmsg: name(s) to long
ok trimnl y  NB. return deblanked name list
)
```

```
checknttab=: 3 : 0
```

*NB.*checknttab v-- checks (name,text) tables. A name text table
NB. is a two column boxed table. Column 0 contains valid names.*

*NB. Column 1 contains character lists representing various texts
NB. like J scripts, LaTeX or HTML code.
NB.
NB. monad: checknttab btcl
NB.
NB. checknttab (;:'n1 n2 n3') ,. 'blah blah..';'more ehh..';'stuff ...'*

```
msg =. ERR014 NB. errmsg: invalid name and text
if. badbu y do. jderr msg
elseif. -. 1 2 e.~ # $ y do. jderr msg
elseif. 2 ~: { $ y=. plt y do. jderr msg
elseif. +./badcl&> 1 {"1 y do. jderr msg
elseif. badrc uv=.checknames (<a;0){y do. jderr msg
elseif. badunique uv=. }.uv do. jderr ERR020
elseif.do. ok <y=. uv (<a;0)} y NB. insures deblanked names
end.
)
```

```
checknttab2=: 4 : 0
```

*NB.*checknttab2 v-- checks (name,class,text) tables. Similar to
NB. (checknttab) except the additional column is a numeric name
NB. class or type code.
NB.
NB. dyad: ilCodes checknttab2 btcl
NB.
NB. (i.4) checknttab2 'name';3;'verb=: ...'*

```

msg=. ERR015 NB. errmsg: invalid name, class and text
if. badbu y do. jderr msg
elseif. -. 1 2 e.~ # $ y do. jderr msg
elseif. 3 ~: { : $ y=. plt y do. jderr msg
elseif. +./badcl&> {:"1 y do. jderr msg
elseif. x badblia 1 {"1 y do. jderr msg
elseif. badrc uv=.checknames (<a;;0){y do. jderr msg
elseif. badunique uv=. }.uv do. jderr ERR020
elseif.do. ok <y=. uv (<a;;0)} y NB. insures deblanked names
end.
)

checknttab3=: 3 : 0

NB.*checknttab3 v-- checks all three (name,[class],text) tables.
NB.
NB. monad: checknttab3 bt

if. 3 = cols=. {:$y do.
  NB. there are two species of three column tables - words
  NB. and macros - distinguished by the codes in column 1
  if. ((i. 4), MACROTYPE) badblia 1 {"1 y do. jderr ERR014
  NB. macro codes start at 21 much higher than J name class codes
  elseif. 3 < <./ ;1 {"1 y do.
    MACROTYPE checknttab2 y
  elseif. do.
    (i. 4) checknttab2 y
  end.

```

```
elseif. 2 = cols do.  
  NB. two column tables  
  checknttab y  
elseif.do. jderr ERR014  
end.  
)  
  
createjod=: 3 : 0  
  
NB.*createjod v-- dictionary object creation verb. (y) is a  
NB. dictionary object locale reference. This verb initializes an  
NB. (ijod) locale user interface for the JOD system. and creates  
NB. all necessary subobjects.  
NB.  
NB. monad: paRc =. createjod ba  
NB.  
NB. JD=: conew 'ajod'  
NB. createjod__JD JD  
  
NB. set default master, profile and user if they don't exist  
if. -.wex <'JMASTER' do. JMASTER=: jodsystempath 'jmaster' end.  
if. -.wex <'JODPROF' do. JODPROF=: jodsystempath 'jodprofile.ijs' end.  
if. -.wex <'JODUSER' do. JODUSER=: jodsystempath 'joduserconfig.ijs' end.  
  
NB. set J version number  
JVERSION_ajod_=: (jvn :: _9:) ''  
  
NB. create master file if necessary
```

```
if. -. fex <JMASTER,IJF do.
  if. badrc mdat=. createmast JMASTER do. mdat return. end.
end.

NB. execute any user script - allows for redefintions of various
NB. class nouns before JOD objects are created - joduserconfig.ijs
NB. is not installed and must be created by users
if. fex <JODUSER do.
  NB. attempt execution of script - obfuscate names (/:)=:
  if. (_9 -: ((0!:0) :: _9:) <JODUSER){0 1 do. (jderr ERR026),<13!:12 '' return. end.
end.

NB. initialize master dictionary parameters - used when
NB. creating directory objects to insure that all master
NB. parameters are set in directory objects - this amends
NB. the "jod" class to exploit inheritance in all derived classes
if. badjr mdat=. jread JMASTER;CNMFPARMS do. jderr ERR006 return. end.
MASTERPARMS_ajod=: > mdat

NB. extension objects and complete (ijod) interface (*)=. JODEXT IZJODALL
JODEXT=: 0$a:
IZJODALL=: IzJODinterface,<'JODobj'

NB. create storage, scratch, maker and utility objects !(*)=. JOD ST SO MK UT
JOD=: y
ST=: conew 'ajodstore'
MK=: conew 'ajodmake'
```



```
UT=: conew 'ajodutil'
```

```
NB. empty classless object - must see ijod
```

```
S0=: cocreate ''  
( 'ijod'; 'z' ) copath ;S0
```

```
obs=. JOD;ST;MK;UT;<S0
```

```
NB. initialize objects - they need to know each other
```

```
createst__ST obs  
createmk__MK obs  
createut__UT obs
```

```
NB. create direct _n_ (ijod) locale interface - if the (ijod)
```

```
NB. trap word (jodsf) exists define an error trapping interface
```

```
".&.> y defzface IzJODinterface
```

```
NB. attempt to create J temp directory ignoring errors
```

```
NB. required for JOD edit utilities and not always present on J systems
```

```
makedir <jpath '~temp/'
```

```
NB. execute any master dictionary profile script
```

```
if. fex <JODPROF do. (_9 -: ((0!0) :: _9:) <JODPROF){1 0 else. 1 end.  
)
```

```
createmast=: 3 : 0
```

```
NB.*createmast v-- creates the dictionary master file. The master
```

```
NB. file holds the master dictionary directory and dictionary
NB. parameters. The master file tracks the state of dictionaries.
NB. In this system only one task can open a dictionary
NB. read/write. When opening a dictionary the master file is
NB. checked to determine if the dictionary has been opened
NB. read/write by another task. Dictionaries can be opened
NB. read/only by any number of tasks.
NB.
NB. monad: createmast clFile
NB.
NB.    createmast_ajod_ JMASTER_ajod_ NB. recreate master

fn=. hostsep y
if. IFWIN do.
    syp=. PATHDEL ,~ (justdrv , ':'_" , justpath) fn
else.
    syp=. PATHDEL ,~ justpath fn
end.

if. badappend jcreate fn do.
    jderr ERR011 NB. errmsg: error(s) creating dictionary master file
    return.
end.

fn=. jopen_jfiles_ fn
cn=. (<0;now '') jappend fn      NB. c0 use bit and last change
'jodversion jodbuildcnt'=. 2{.JODVMD
```

```

cn=. cn, (<jodversion;jodbuildcnt,didnum 0) jappend fn  NB. c1 version, build #, unique id
cn=. cn, (4 0$'') jappend fn      NB. c2 dictionary directory
cn=. cn, (4 0$'') jappend fn      NB. c3 directory backup
cn=. cn, (3#<'') jappend fn      NB. c4,c5,c6 RESERVED

```

NB. parse parameter settings --- sets (MASTERPARMS)

```

try.
  0!:0 <syp,PARMFILE
  parms=. <dptable MASTERPARMS  NB. created by 0!:0 !(*)=. MASTERPARMS
catchd.
  jclose_jfiles_ fn
  (jderr ERR027),<syp,PARMFILE return.
end.

```

```

cn=. cn, parms jappend fn      NB. c7 active dictionary parameters
cn=. cn, parms jappend fn      NB. c8 active parameter backup
cn=. cn, parms jappend fn      NB. c9 default parameters
cn=. cn, (i.0) jappend fn      NB. c10 dictionary log
jclose_jfiles_ fn
if. 0 > <./cn do.
  jderr ERR011
else.
  ok {: cn  NB. return last component
end.
)

```

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&#:Q<.`

NB. enclose all character lists in blcl in " quotes

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

`decomm=: 3 : 0`

*NB.*decomm v-- removes comments from j words. The (x) argument*

NB. specifies whether all blank lines are removed or retained.

NB.

NB. monad: decomm ctWord

NB.

NB. decomm jcr 'decomm' NB. decomment self

NB.

NB. dyad: pa decomm ctWord

NB.

NB. 1 decomm jcr 'decomm' NB. remove blanks (default)

NB. 0 decomm jcr 'decomm' NB. retain all blank lines

`1 decomm y`

`:`

NB. mask of unquoted comment starts

`c=. ($y)$'NB.' E. ,y`

`c=. +./\"1 c > ~:/\"1 y e. ''''`

NB. ,, work around for j8.05 bug - remove when fixed

```
y=. ,.y

NB. blank out comments
y=. ' ' (I. ,c)} y
y=. y $~ $c

NB. remove blank lines - default
if. x do. y #~ y +./ . ~: ' ' end.
)

defzface=: 4 : 0

NB.*defzface v-- define (ijod) interface from word list.
NB.
NB. dyad: blcl =. clSuffix defzface blclWords

NB. if the top level error trap word exists
NB. define an error trapping interface
if. 3 = (4!:0) <'jodsf_ijod_' do.
  iface=. (y ,&.> locsfx x) ,&.> <' :: jodsf'
else.
  iface=. y ,&.> locsfx x
end.
(y ,&.> <'_ijod_=:') ,&.> iface
)

del=: 3 : 0
```

*NB.*del v-- deletes objects in dictionary database files. Result
NB. is a return code and message. The deletion only modifies the
NB. object's directory. The actual data remains in the file as
NB. "dead" components until a (packd) operation reclaims file
NB. space.*

NB.

NB. monad: del blclWords

NB.

NB. del ;: 'we are toast'

NB.

NB. dyad: iaObject del blclName

NB.

NB. 1 del 'toast these tests'

WORD del y

:

msg=. ERR001

if. badil x do. jderr msg return. end.

NB. do we have a put dictionary open?

if. badrc uv=. checkput__ST 0 do. uv return. end.

DL=. 1 { uv

select. x

case. WORD do.

(WORD;INVWORDS__ST;<DL) delstuff__ST y

case. TEST do.

```
(TEST;INVTESST__ST;<DL) delstuff__ST y
case. GROUP do.
  (GROUP;INVGROUPS__ST;<DL) delstuff__ST y
case. SUITE do.
  (SUITE;INVSUITES__ST;<DL) delstuff__ST y
case. MACRO do.
  (MACRO;INVMACROS__ST;<DL) delstuff__ST y
case. REFERENCE do.
  if. badrc y=. checknames y do. y
  elseif. badrc msg=. DL delwordrefs__ST }. y do. msg
  elseif.do. (ok OK009),<DNAME__DL
  end.
case. do. jderr msg
end.
)
```

```
destroyjod=: 3 : 0
```

```
NB.*destroyjod v-- dictionary object destroy verb. This verb
NB. erases the JOD (ijod) locale user interface.
```

```
NB.
```

```
NB. monad: destroyjd uuIgnore
```

```
NB. close any open dictionaries
```

```
3 od ''
```

```
NB. erase current direct _n_ ijod locale references
```

```
NB. (*)=. IZJODALL JODEXT
```

```
(4!:55) IZJODALL ,&.> locsfx 'z'
```

```
NB. destroy sub-objects !(*)=. ST MK UT SO  
coerase ST,MK,UT,SO
```

```
NB. destroy any JOD class extension objects  
coerase JODEXT
```

```
NB. return self reference  
18!:5 ''  
)
```

```
did=: 3 : 0
```

```
NB.*did v-- dictionary identification and statistics  
NB.  
NB. monad: did uuIgnore  
NB. dyad: uuIgnore did uuIgnore
```

```
if. badrc msg=. checkopen__ST 0 do. msg else. ok {."1 DPATH__ST end.  
:  
0 didstats__ST 0  
)
```

```
didnum=: 3 : 0
```

```
NB.*didnum v-- generates a unique extended precision integer
```



```
NB. based GUID. The GUID is designed to produce a unique global
NB. identifier every time it's called.
NB.
NB. monad: didnum uuIgnore
```

```
NB. Original Windows only code
NB. call dll to get GUID
NB. guid=. genguid <16#' '
NB. if. 0 ~: >{. guid do. jderr ERR021
NB. else.
NB. NB. guid as 128 bit mask
NB. guid=. , (a. i. >{: guid){ truth 8
NB.
NB. NB. convert mask to an integer computing
NB. NB. only required extended powers of 2
NB. pos=. I. guid
NB. +/(2x ^ pos) pos} guid
NB. end.
```

```
NB. More general Win/Linux/Mac code
guidsx i.0
)
```

```
dnl=: 3 : 0
```

```
NB.*dnl v-- list objects in dictionary database files.
NB.
NB. monad: dnl clStr/zlStr
```

```

NB.
NB.  dnl ''      NB. list all words on path
NB.  dnl 'pfx'   NB. list all words on path begining with 'pfx'
NB.
NB. dyad:  ilCodes dnl clStr/zlStr
NB.
NB.  4 2  dnl 'ex' NB. macros with names containing 'ex'
NB.  0 _3 dnl 'ugh' NB. path order listing of words ending with 'ugh'

WORD dnl y
:
if. badrc msg=.x nlargs y do. msg return. end.

NB. format standard (dnl) (x) options and search
x=. x , (<:#x)}. 1 , DEFAULT
if. ({. x) e. OBJECTNC do. x dnlsearch__ST y else. jderr ERR001 end.
)

dpset=: 3 : 0

NB.*dpset v-- set dictionary parameters.
NB.
NB. monad:  dpset zl | clCommand | (cllParm ; uuValue)
NB. dyad:   iaCode dpset (clParm ; uuValue)

NB. objects !(*)=. DL ST
NB. allow mixed assignments (<:)=:
```

```
NB. resets should always work - close any open dictionaries
if. y -: 'RESETME' do.
  3 od '' NB. HARDCODE 3 close code
  if. badrc msg=. markmast~0 do. msg else. ok OK004 [ remast 1 end.
elseif. y -: 'RESETALL' do.
  3 od '' NB. HARDCODE 3 close code
  if. badrc msg=. markmast~0 do. msg else. ok OK004 [ remast 0 end.
elseif.do.
  NB. other options require an open dictionary
  if. badrc msg=.checkopen__ST 0 do. msg return. end.
  DL=.  {:{:DPATH__ST

if. isempty y do.
  NB. display settable parameters of put/first with current values
  ok <|:>{:>jread WF__DL;CNPARMS__ST

elseif. -.badcl y do.
  NB. if we are resetting READWRITE status dictionary need only be open
  if. 'READWRITE' -: y do.

    NB. check attributes of READONLY dictionary to insure
    NB. that it will allow read/write operations on all files
    dcfiles=. (WF__DL;TF__DL;GF__DL;SF__DL;MF__DL;UF__DL) ,&.> <IJF
    NB. err msg (JODstore errors): dictionary file attributes do not allow read/write
    if. 0 e. iswriteable__ST dcfiles do. (jderr ERR095__ST),<DNAME__DL return. end.

  if. badrc msg=.libstatus__DL 0 do. msg
```

```
else.  
  RW__DL=: -. LIBSTATUS__DL=: 0 NB. library off/read write  
  ok OK008;DNAME__DL  
end.  
return.  
end.  
NB. other changes of dictionary parameters require a put dictionary  
if. badrc msg=. checkpoint__ST 0 do. msg return. end.  
select. y  
case. 'DEFAULTS' do.  
  if. badjr dat=. jread JMASTER;CNMF ParmDEFS do. jderr ERR088  
  elseif. badjr dpt=. jread WF__DL;CNP ARMS__ST do. jderr ERR088  
  elseif. dpt=. <{:>dpt),<|: 1 0 1#"1 dat=. >dat  
    badreps dpt jreplace WF__DL;CNP ARMS__ST do. jderr ERR017  
  elseif.do.  
    NB. reset live object parameters  
    (({"1 dat) ,&.> locsfx DL)=: {"1 dat  
    ok OK003;DNAME__DL  
  end.  
case. 'CLEARPATH' do.  
  RPATH__DL=. i.0  
  if. badreps (i.0) jreplace UF__DL;CNP RPATH__ST do.  
    jderr ERR017  
  else.  
    ok OK005;DNAME__DL  
  end.  
case. 'READONLY' do.
```

```

    if. badrc msg=.libstatus__DL 1 do. msg
    else.
        RW__DL=: -. LIBSTATUS__DL=: 1 NB. library on/read only
        ok OK007;DNAME__DL
    end.
case.do. jderr ERR001
end.

elseif. -.badbu y do.
    NB. parameter changes only allowed for put dictionaries
    if. badrc msg=. checkpoint__ST 0 do. msg return. end.
    msg=. ERR019 NB. errmsg: invalid name/parameter
    if. -. (1=#$ y) *. 2=#y do. jderr msg return. end.
    if. badjr dpt=. jread WF__DL;CNPARMS__ST do. jderr ERR088 return. end.
    usp=. >{:dpt=. >dpt
    if. ({$usp) = pos=. ({.usp) i. {.y do. jderr msg return. end.
    if. (>pos{{:usp) badsts >{:y do. jderr msg return. end.
    NB. reset live object
    ('__DL' ,~ >pos{{.usp)=: >{:y
    dpt=. (}:dpt),<usp=. ({:y) (<1;pos)} usp
    if. badreps (<dpt) jreplace WF__DL;CNPARMS__ST do. jderr ERR017 else. ok OK006;y end.

elseif.do. jderr ERR001
end.
end.
)

dptable=: 3 : 0

```

```
NB.*dptable v-- parses MASTERPARMS.
NB.
NB. (MASTERPARMS) is set by running the script (jodparms.ijs).
NB.
NB. monad: dptable clParms
NB.
NB. 0!:0 <jpath '~addons\general\jodparms.ijs'
NB. dptable__JODobj MASTERPARMS

NB. parse MASTERPARMS table - remove J comments
y=. (<:_1)"1 ' '; ' ,. decomm ] ; _2 y -. CR

NB. remove extra blanks
y=. (alltrim&.>(<a;;0 1){y} (<a;;0 1)} y

NB. handle parm types currently only (+integer) and (character)
NB. NIMP - there is no error checking for dictionary parameters
ptype=. > 1{"1 y
pint=. I. (,:'(+integer)') ({."1)@E. ptype

NB. character and other types left as is
NB. char=. I. (,:'(character)') ({."1)@E. ptype
y=. (".&.> (<pint;2){y} (<pint;2)} y
)

NB. 1 if empty dictionary name list 0 otherwise
empdnl=: (,<0$0) -: ]
```

NB. test boxed list of path\file names for existence (0 some bad, 1 all ok)

```
fex=: *./@:(1:@(1!:4) ::0:)
```

NB. 0's all but the first 1 in runs of 1's

```
firstone=: ] > [: }: 0: , ]
```

NB. first of doubles

```
fod=: ] #~ 1 0" _ $~ #
```

NB. first on path order list index - see long documentation

```
fopix=: 1: i.~ [ +/@:e.&> [: < [: < ]
```

```
gdeps=: 3 : 0
```

*NB.*gdeps v-- group and suite dependents.*

NB.

NB. Dependents are global J assignments between the dependents tags:

NB.

NB. verbatim:

NB.

*NB. NB.*dependents*

*NB. NB.*enddependents*

NB.

NB. monad: gdeps clGroup

NB.

NB. gdeps 'jod'

NB.

```

NB. dyad:   iaGScore gdeps clGroupSuite
NB.
NB.   3 gdeps

GROUP gdeps y
:
if. badil x      do. jderr ERR001 NB. errmsg: invalid options
elseif. badcl y do. jderr ERR002 NB. errmsg: invalid name(s)
elseif. x=. {.x
      -. x e. GROUP,SUITE do. jderr ERR001
elseif. badrc uv0=. (x,1) obtext__UT y do. uv0
elseif.do.
  uv0=. ,>2{uv0
  NB. hides tags from searches
  beg=. 'NB.*',DEPENDENTSSTART
  fin=. 'NB.*',DEPENDENTSEND
  tcnt=. (+/beg E. uv0),+/fin E. uv0
  select. tcnt
  case. 0 0 do. ok ''
  case. 0 1 do. jderr ERR024 NB.errmsg: dependent block unbalanced
  case. 1 0 do. jderr ERR024
  case. 1 1 do.
    uv0=. ];._1 LF,fin beforestr uv0 -. CR
    0 namecats__MK uv0 }.~ I. (,:beg) +./"1@E. uv0
  case.do.
    jderr ERR025 NB. errmsg: only one balanced dependent block allowed
end.

```



```
end.
)

get=: 3 : 0

NB.*get v-- retrieves objects from dictionary database files.
NB.
NB. monad:  get blcl
NB.
NB.   get ;: 'us poor little words'
NB.
NB. dyad:  ilCodes get bluu
NB.
NB.   2 8 put 'GroupName';'Group documentation text ....'
NB.   2 8 get 'GroupName'
NB.   4 get 'MacroText'

WORD get y
:
msg=. ERR001 [ loc =. <'base' NB. errmsg: invalid option(s)

if. badil x do.
  NB. errmsg: invalid or missing locale
  if. _2&badlocln x do. jderr ERR004 return. else. x=. WORD [ loc=. <x-. ' ' end.
end.

NB. do we have a dictionary open?
if. badrc uv=. checkopen__ST 0 do. uv return. end.
```

NB. format standard (x) options

```
x=. x , (-3-#x) {. DEFAULT , 0
if. -. 0 1 e.~ {: x do. jderr msg return. end.
```

```
select. {. x
case. WORD do.
  select. second x
    case. DEFAULT do. loc defwords__ST y
    case. EXPLAIN do. WORD getexplain__ST y
    case. DOCUMENT do. WORD getdocument__ST y
    case. NVTABLE do. (WORD,0) getobjects__ST y
    case. INCLASS;INCREATE;INPUT;INSIZE do. (2{.x) invfetch__ST y
    case. -INPUT do. WORD getntstamp__ST y
    case.do. jderr msg
  end.
case. TEST do.
  select. second x
    case. DEFAULT do. (TEST,0) getobjects__ST y
    case. EXPLAIN do. TEST getexplain__ST y
    case. DOCUMENT do. TEST getdocument__ST y
    case. INCREATE;INPUT;INSIZE do. (2{.x) invfetch__ST y
    case. -INPUT do. TEST getntstamp__ST y
    case.do. jderr msg
  end.
case. GROUP do.
  select. second x
```

```
    case. DEFAULT do. GROUP getgstext__ST y
    case. EXPLAIN do. GROUP getexplain__ST y
    case. DOCUMENT do. GROUP getdocument__ST y
    case. INCREASE;INPUT do. (2{x}) invfetch__ST y
    case. -INPUT do. GROUP getntstamp__ST y
    case.do. jderr msg
end.
case. SUITE do.
  select. second x
    case. DEFAULT do. SUITE getgstext__ST y
    case. EXPLAIN do. SUITE getexplain__ST y
    case. DOCUMENT do. SUITE getdocument__ST y
    case. INCREASE;INPUT do. (2{x}) invfetch__ST y
    case. -INPUT do. SUITE getntstamp__ST y
    case.do. jderr msg
  end.
case. MACRO do.
  select. second x
    case. DEFAULT do. (MACRO,0) getobjects__ST y
    case. EXPLAIN do. MACRO getexplain__ST y
    case. DOCUMENT do. MACRO getdocument__ST y
    case. INCLASS;INCREASE;INPUT;INSIZE do. (2{x}) invfetch__ST y
    case. -INPUT do. MACRO getntstamp__ST y
    case.do. jderr msg
  end.
case. DICTIONARY do.
  select. second x
```

```
    case. DEFAULT do. getdicdoc__ST 0
    case.do. jderr msg
  end.
case.do. jderr msg
end.
)

globals=: 4 : 0
if. badcl y do. jderr ERR002 return. end. NB. errmsg: invalid name(s)
if. badrc y=. 0 checknames y do. y
else.
  y =.>1{y
  NB. use base locale if no locale reference
  if. -.islocref y do. y=. y, '_base_' end.
  x wrdglobals__MK y
end.
)

globs=: 3 : 0

NB.*globs v-- analyze, report and store global names
NB.
NB. monad:  globs clName
NB.
NB.  globs 'word'    NB. list globals in locale word
NB.
NB. dyad:    iaCode globs clName
```

```

NB.
NB.  NB. stores global references of word in dictionary
NB.  0 globs 'word'
NB.
NB.  1 globs 'test'  NB. list globals in test

0 globals y
:
if. (,x)-:,REFERENCE do. 1 globals y
elseif. badc1 y do. jderr ERR002 NB. errmsg: invalid name(s)
elseif.do.
  select. x
  case. WORD do.
    if. badrc uv=. checkpoint__ST 0 do. uv return. else. DL=. 1 { uv end.
    if. badrc y=. checknames__ST y do. y return. else. y=. ,>}.y end.
    if. badrc uv=. (WORD;<DL) inputdict__ST <y do. uv return. end.
    if. badrc uv=. WORD getobjects__ST y do. uv return. else. uv=. ,1 {:: uv end.
    if. 0=>1{uv do. ok '<',y,'>',OK002 return. end.
    if. badrc uv=. 0 namecats__MK ];. _2 (>2{uv),LF do. uv return. end.
    (y;<DL) putwordxrs__ST }.uv
  case. TEST do.
    if. badrc uv=. TEST get y do. uv return. else. uv=. ,1 {:: uv end.
    NB. return references in stored test text
    0 namecats__MK ];. _2 (>1{uv),LF
  case.do. jderr ERR001 NB. errmsg: invalid option(s)
end.
end.

```

```
)

grp=: 3 : 0

NB.*grp v-- create and modify groups.
NB.
NB. monad: grp blcl
NB. dyad: ia grp ?

GROUP grp y
:
select. x
  case. GROUP do. (GROUP,WORD) gsmakeq y
  case. SUITE do. (SUITE,TEST) gsmakeq y
  case.do. jderr ERR001 NB. errmsg: invalid option(s)
end.
)

gsmakeq=: 4 : 0

NB.*gsmakeq v-- make or query groups and suites.
NB.
NB. dyad: ilCodes gsmakeq blcl

'gscore obcode'=. x

if. isempty y do. gscore dnl ''
```

```
else.  
  if. badcl y do.  
  
    NB. create/modify group  
    if. badrc mdl=. checkput__ST 0 do. mdl return. end.  
    if. badrc msg=. checkpath__ST {: mdl do. msg return. end.  
    NB. remove empties from name list allows (grp 'name';') to create null groups  
    if. badrc y=. checknames y -. a: do. y return. end.  
    (({:mdl);obcode;gscode) putgs__ST }. y  
  
  else.  
  
    NB. query group contents  
    if. badrc msg=. checkopen__ST 0 do. msg return. end.  
    if. badrc y=. checknames y do. y return. end.  
    gscode gslistnl__ST rv y  
  end.  
end.  
)  
  
guids=: 3 : 0  
  
NB.*guids v-- create guid as 16 byte strings on supported J systems.  
NB.  
NB. This verb taken from ~addons/general/misc/guids.ijs returns guid  
NB. on Windows, Linux and Mac systems.  
NB.  
NB. monad:  guid z1 | ilShape
```

```

NB.
NB.  guids ''      NB. create guid as a 16-byte character string
NB.  guids $0
NB.  guids 3 4     NB. create 3x4 array of 16-byte strings

if. IFWIN do.
  cmd=. 'ole32 CoCreateGuid i *c'
else.
  cmd=. ((UNAME-:'Darwin'){::'libuuid.so.1';'libSystem.B.dylib'),' uuid_generate n *c'
end.
>{: "1 cmd 15!:0"1 0 <"1 (y,16)$' '
)

NB. guids as extended precision integers: guidsx i.0 [ guidsx 3 5
guidsx=: 256 #. [: x: a. i. guids

NB. returns result of linux/unix commands as text string
host=: [: 2!:0 '("$ _ , ] , ' || true)'"_

NB. 1 if noun is empty on any axis and 0 otherwise
isempty=: 0: e. $

NB. 1 if name is a locale reference 0 otherwise
islocref=: ('_' = {:) +. [: +./ '___' E. ]

NB. error trapped call to jappend_jfiles_
jappend=: jappend_jfiles_ ::(_2:)

```


NB. character table representation of j words, call: jcr 'verb'
jcr=: [:] ; _1 (10{a.) , [: 5!:5 <

NB. error trapped call to jcreate_jfiles_
jcreate=: jcreate_jfiles_ ::0:

NB. format error message
jderr=: 0: ; '!JOD error: '"_ ,]

jdmasterr=: 3 : 0

*NB.*jdmasterr v-- master error handling.*

NB.

*NB. Use when the master file is set otherwise the master will not
NB. be properly reset. Because of the file overhead I decided to
NB. use a second error handler instead of burdening the very
NB. frequently called (jderr) with this often unnecessary file
NB. access function.*

if. badrc msg=.markmast~0 do. msg else. jderr y end.
)

jnfrblcl=: 3 : 0

*NB.*jnfrblcl v-- extracts valid J names from boxed lists of
NB. character lists. Only proper unquoted, inflection free (no
NB. trailing .'s) names are returned. This verb extracts names*

*NB. without using name class tests. Class tests cannot be used on
NB. indirect locale names, eg. (BOO_HOO) as the noun (HOO) must
NB. exist.*

NB.

NB. monad: jnfrblcl blcl

NB.

NB. jnfrblcl 'good'; ' ' bad'; '888'; 'ok'; 'notok.'; '3r7'

NB. trim end blanks and eliminate any empties

```
y=. y #~ 0 < #&> y=.alltrim&.> y
```

NB. remove all lists containing invalid name characters

```
y=. y #~ y *./@:e.&> <ALPHA, '_'
```

NB. remove all lists beginning with numerals and _

```
y=. y #~ -.({.&> y) e. '_0123456789'
```

NB. extract any remaing names with regular expression

```
if. #y do. JNAME rxall ; y ,&.> ' ' else. ' ' end.  
)
```

NB. standarizes J path delimiter to unix/linux forward slash

```
jpathsep=: '/'&(('\ ' I.@:= ]))
```

NB. error trapped call to jread_jfiles_

```
jread=: jread_jfiles_ ::(_2:)
```

NB. error trapped call to jreplace_jfiles_
jreplace=: jreplace_jfiles_ ::(_2:)

NB. extracts the drive from qualified file names
justdrv=: [: }:] #~ [: +./\ . ':'&=

jvn=: 3 : 0

*NB.*jvn-- J version number.*

NB.

NB. monad: na =. jvn uuIgnore

NB. J version number

ver=. 9!:14 ''

ver=. (ver e. '0123456789/')#ver

NB. return version 6.01 if string is not numeric

100 %~ , 601 ". (ver i. '/') {. ver
)

NB. removes all leading and trailing CR and LF characters

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

NB. surround names with locale delimiters, eg: _name_

locsfx=: ' _ '&, @, & ' _ '&.>

```
make=: 3 : 0
```

```
NB.*make v-- makes J scripts.
```

```
NB.
```

```
NB. monad: make zl/cl
```

```
NB.
```

```
NB. make '' NB. basic put dump
```

```
NB.
```

```
NB. dyad: ilObjOpt make cl/blcl
```

```
NB.
```

```
NB. 0 make ;:'an arbitrary list of words into a script and file it'
```

```
NB. 0 2 make ;: 'a list of words returned as a character list'
```

```
NB.
```

```
NB. 3 make 'suite' NB. make suite write to script subdirectory
```

```
NB. 2 2 make 'group' NB. make group return character list
```

```
NB.
```

```
NB. NB. make groups that are not in put dictionary
```

```
NB. NB. file is written to put dictionary script directory
```

```
NB. 2 _1 make 'deepgroup'
```

```
makedump__MK y
```

```
:
```

```
msg=. ERR001 NB. errmsg: invalid option(s)
```

```
if. badil x do. jderr msg return. end.
```

```
NB. do we have a dictionary open?
```

```
if. badrc uv=. checkopen__ST 0 do. uv return. end.
```

NB. format standard (x) options HARDCODE

```
x=. 2 { . x , 1 2
if. -.({: x) e. _2 _1 1 2 do. jderr msg return. end.
```

```
if. ({. x) e. GROUP,SUITE do. x makegs__MK y
elseif. ({. x)=WORD do.
  if. badrc uv=.WORD obtext__UT y do. uv
  elseif. 1={: x do. (WORD;1{uv) writeijs__MK >{:uv
  elseif.do. ok >{: uv
  end.
elseif.do. jderr msg
end.
)
```

NB. make a directory (1 success, 0 failure)

```
makedir=: 1!:5 ::0:
```

```
markmast=: 3 : 0
```

*NB.*markmast v-- marks the master dictionary file. This system is
NB. is primarily a single writer system. Many dictionary tasks
NB. can read data but only one task can change it. The master
NB. file is used to enforce this protocol. (markmast) sets and
NB. unsets a use bit. When the bit is set the master file itself
NB. cannot be changed.
NB.*

```

NB. monad: markmast uuIgnore
NB. dyad: uuIgnore markmast uuIgnore

NB. set the use bit/timestamp in the master file
if. badjr ub=. jread JMASTER;CNMFMARK do. jderr ERR006 NB. errmsg: cannot read master
elseif. >{.>ub do. jderr ERR012 NB. errmsg: master in use - wait or try (dpset)
elseif. badreps (mubmark y) jreplace JMASTER;CNMFMARK do.
  jderr ERR013 NB. errmsg: cannot mark master
elseif.do. ok y
end.
:
NB. dyad resets the master
if. badreps (mubmark 0) jreplace JMASTER;CNMFMARK do. jderr ERR013 else. ok 0 end.
)

mnl=: 3 : 0

NB.*mnl v-- list objects in all registered dictionaries.
NB.
NB. monad: mnl clStr | zlStr
NB.
NB. mnl '' NB. list all words in all registered dictionaries
NB. mnl 'pfx' NB. list all words in all registered dictionaries starting with 'pfx'
NB.
NB. dyad: ilCodes mnl clStr | zlStr
NB.
NB. 4 2 mnl 'ex' NB. macros with names containing 'ex' in all registered dictionaries
NB. 2 3 mnl 'et' NB. groups with names ending with 'et' in all registered dictionaries

```

```
NB.  4 3 25 mnl '_sql' NB. text macros with names ending '_sql'
NB.  0 _1 mnl 'se'  NB. duplicate words starting with 'se'

WORD mnl y
:

NB. (mnl) does not require open dictionaries
if.      badcl y do. jderr ERR010  NB. errmsg: invalid name pattern
elseif. badil x do. jderr ERR001  NB. errmsg: invalid option(s)
elseif. do.

  NB. format standard (mnl) (x) options and search
  x=. 3 {. x , (<:#x)}. 1 , DEFAULT

  NB. validate options
  if. -.((1{x} e. PATOPS) *. (0{x} e. OBJECTNC do. jderr ERR001 return. end.

if. WORD = 0{x do.

  if. -. (2{x} e. (i. 4),DEFAULT      do. jderr ERR001 return. end.

elseif. (0{x} e. TEST,GROUP,SUITE do.

  if. DEFAULT ~: 2{x                do. jderr ERR001 return. end.

elseif. MACRO = 0{x do.
```

```
    if. -(2{x) e. MACROTYPE,DEFAULT do. jderr ERR001 return. end.

elseif. do. jderr ERR001 return.

end.

x mnlsearch__ST y
end.
)

NB. master use bit mark
mubmark=: ] ; [: (6!:0) 0: $ ]

NB. J name class override - traps limit error for very long names
nc=: 4!:0 ::(_2:)

newd=: 3 : 0

NB.*newd v-- creates a new dictionary
NB.
NB. monad: newd clName | (clName ; clPath)
NB.
NB. newd 'NewODict' NB. store in default J user directory
NB. newd 'New1Dict'; 'c:\put\it\here' NB. windows drives
NB. newd 'New2Dict'; '\\shared\netdrive\new2' NB. windows UNC shares
NB. newd 'New3Dict'; '/home/john/temp/new3' NB. linux rooted paths
```



```
if. badcl y do.
  1 newregdict__ST y
else.
  drn=. y -. y -. ALPHA NB. safe directory chars only
  1 newregdict__ST y;hostsep (jpath '~user\'),JJODDIR,(255<.#drn){.drn
end.
)

nlargs=: 4 : 0

NB.*nlargs v-- test basic name list arguments
NB.
NB. dyad: il nlargs cl

if.      badcl y do. jderr ERR010 NB. errmsg: invalid name pattern
elseif. badil x do. jderr ERR001 NB. errmsg: invalid option(s)
NB. do we have a dictionary open?
elseif.do. checkopen__ST 0
end.
)

NB. numeric list timestamp
now=: 6!:0

NB. convert timestamp to yyyymmdd
nowfd=: ([: 0 100 100&#. 3: {. ]) + ([: 24 60 60&#. 3: }. ]) % 86400 "_
```

```
obidfile=: 3 : 0
```

```
NB.*obidfile v-- location of jod object id history file.
```

```
NB.
```

```
NB. monad: obidfile uuIgnore
```

```
(jodsystempath ''), 'jod.ijn'  
)
```

```
od=: 3 : 0
```

```
NB.*od v-- opens and closes dictionaries.
```

```
NB.
```

```
NB. monad: od clDictionary/blclDictionary
```

```
NB.
```

```
NB. dyad: iaOption od clDictionary/blclDictionary
```

```
NB.
```

```
NB. od 'test dictionary'; 'another test dictionary' NB. open r/w
```

```
NB. 3 od 'test dictionary' NB. close
```

```
1 od y
```

```
:
```

```
msg=. ERR005 NB. errmsg: invalid or missing dictionary names
```

```
NB. list all registered dictionaries (short form)
```

```
if. badjr mdt=. jread JMASTER; CNMFTAB do.
```

```
jderr ERR006 return.
```

```
end.
```

```
dl=. 0{>mdt

select. x
case. 1 do.    NB. HARDCODE: magic numbers read/write codes

    if. isempty y do. ok /:~ dl
    else.
        NB. open read/write
        y=. boxopen ,y
        NB. all dictionary names must be on master list
        if. */y e. dl do. y opendict__ST 1;mdt else. jderr msg end.
    end.

case. 2 do.

    NB. open read/only
    y=. boxopen ,y
    if. */y e. dl do. y opendict__ST 2;mdt else. jderr msg end.

case. 3 do.

    NB. close dictionaries
    if. badrc msg1=. checkopen__ST 0 do. msg1 return. end.
    if. isempty y do. y=. {."1 DPATH__ST else. y=.boxopen ,y end.
    if. */y e. dl do. mdt closedict__ST y else. jderr msg end.

case. 4 do.
```

NB. HARDCODE (mdt rows) display dictionary names and source paths

```
mdt=. jpathsep&.> 0 2{>mdt
ok <(/:0{mdt){ |: mdt
```

```
case. 5 do.
```

NB. return the currently registered dictionaries as a (regd) script

```
mdt=. quote&.> 0 2{>mdt
mdt=. ctl ;"1 (<'regd ' ) ,"1 |: 1 0 2{ (<';'),mdt
NB. prefix command to close and unregister all current dictionaries
mdt=. 'NB. require 'general/jod'',LF,'3 regd&> }. od'''' [ 3 od ''',LF,mdt
ok 'NB. JOD registrations: ',(tstamp ''),LF,jpathsep mdt
```

```
case.do. jderr ERR001 NB. errmsg: invalid option(s)
```

```
end.
```

```
)
```

NB. format normal return

```
ok=: 1: ; ]
```

```
packd=: 3 : 0
```

*NB.*packd v-- backs up and recovers wasted space in dictionary*

NB. files. Backups are stored in the dictionary's backup

NB. directory. Sets of backup files are prefixed with an ever

NB. increasing backup number, e.g: 13jwords.ijf. Dictionary files

```
NB. are NEVER deleted by JOD commands.
NB.
NB. monad: packd clName
NB.
NB.   packd 'dictionary'

NB. NIMP: packd/restd not supported on iOS/Android devices for now
NB. if. badrc uv=. checksup 'packd' do. uv return. end.

NB. only put dictionaries can be packed
if. badrc uv=. checkput__ST 0 do. uv return. end.
DL=. 1 { uv NB. directory object !(*)=. DL

NB. is there enough space on the backup volume?
if. badrc uv=. packspace__DL 0 do. uv return. end.

packdict__DL y
)

NB. promote lists to tables - other ranks unchanged
plt=: ]`,.:@.(1&=@:(#@:$))

put=: 3 : 0

NB.*put v-- stores objects in dictionary database files.
NB.
NB. monad: put blclWords
```

```
NB.
NB.  put ;: 'it where the sun dont shine'
NB.
NB. dyad:  ilCodes put bluu
NB.
NB.  2 7 put 'GroupName';'Group documentation text ....'

WORD put y
:
msg=. ERR001 [ loc=. <'base' NB. errmsg: invalid option(s)

NB. do not save decommented words - set PUTBLACK to 1 to override
if. -. PUTBLACK +. 9!:40'' do.
  NB. errmsg: white space preservation is off - turn on to put
  jderr ERR023 return.
end.

if. badil x do.
  NB. errmsg: invalid or missing locale
  if. _1&badlocln x do. jderr ERR004 return. else. x=. WORD [ loc =. <x-. ' ' end.
end.

NB. do we have a put dictionary open?
if. badrc uv=. checkpoint__ST 0 do. uv return. end.
DL=. 1 { uv NB. directory object !(*)=. DL

NB. format standard (x) options
```

```
x=. 2 {. x , DEFAULT

select. {. x
case. WORD do.
  select. second x
  case. DEFAULT do. (loc;<DL) putwords__ST y
  case. EXPLAIN do. (WORD;<DL) putexplain__ST y
  case. DOCUMENT do. (WORD;1;<DL) puttexts__ST y
  case. NVTABLE do.
    if. badrc y=. (i. 4) checknttab2 y do. y else. (WORD;<DL) puttable__ST y end.
  case. -INPUT do. (WORD;<DL) putntstamp__ST y
  case.do. jderr msg
end.
case. TEST do.
  select. second x
  case. DEFAULT do.
    if. badrc y=. checknttab y do. y else. (TEST;<DL) puttable__ST y end.
  case. EXPLAIN do. (TEST;<DL) putexplain__ST y
  case. DOCUMENT do. (TEST;1;<DL) puttexts__ST y
  case. -INPUT do. (TEST;<DL) putntstamp__ST y
  case.do. jderr msg
end.
case. GROUP do.
  select. second x
  case. DEFAULT do. (GROUP;0;<DL) puttexts__ST y
  case. EXPLAIN do. (GROUP;<DL) putexplain__ST y
  case. DOCUMENT do. (GROUP;1;<DL) puttexts__ST y
```

```

NB. HARDCODE - lines inserted to maintain put/get symmetry for
NB. the frequent argument cases 2 1 and 3 1
case. 1 do. (GROUP;0;<DL) puttexts__ST y
case. -INPUT do. (GROUP;<DL) putntstamp__ST y
case.do. jderr msg
end.
case. SUITE do.
select. second x
case. DEFAULT do. (SUITE;0;<DL) puttexts__ST y
case. EXPLAIN do. (SUITE;<DL) putexplain__ST y
case. DOCUMENT do. (SUITE;1;<DL) puttexts__ST y
case. 1 do. (SUITE;0;<DL) puttexts__ST y NB. HARDCODE
case. -INPUT do. (SUITE;<DL) putntstamp__ST y
case.do. jderr msg
end.
case. MACRO do.
select. second x
case. DEFAULT do.
if. badrc y=. MACROTYPE checknttab2 y do. y else. (MACRO;<DL) puttable__ST y end.
case. EXPLAIN do. (MACRO;<DL) putexplain__ST y
case. DOCUMENT do. (MACRO;1;<DL) puttexts__ST y
case. -INPUT do. (MACRO;<DL) putntstamp__ST y
case.do. jderr msg
end.
case. DICTIONARY do.
select. second x
case. DEFAULT do. putdicdoc__ST y

```



```
    case.do. jderr msg
  end.
case.do. jderr msg
end.
)
```

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

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

```
NB. reads a J binary noun file
readnoun=: 3!:2@ (1!:1&[]`<@.(32&>@ (3!:0)))
```

```
readobid=: 3 : 0
```

```
NB.*readobid v-- unique object ids that opened dictionaries
NB. read/write on this machine.
NB.
NB. monad: readobid uuIgnore
```

```
(readnoun :: ((i.0)"_)) obidfile 0
)
```

```
regd=: 3 : 0
```

```
NB.*regd v-- register and unregister JOD dictionaries.
NB.
NB. monad:  regd blcl
NB.
NB.   regd 'name'; 'c:\location\of\files'; 'documentation...'
NB.
NB. dyad:   iaOption make cl
NB.
NB.   3 regd 'name' NB. unregister dictionary

0 newregdict__ST y
:
if. x->3 do. NB. HARDCODE option
  NB. errmsg: invalid or missing dictionary name(s)
  if. badcl y do. jderr ERR005 return. end.
  NB. errmsg: dictionary in use - cannot unregister
  if. (<,y) e. {"1 DPATH__ST do. jderr ERR018 return. end.
  NB. errmsg: cannot read master
  if. badjr mdt=. jread JMASTER;CNMFTAB do. jderr ERR006 return. end.
  mdt=>mdt
  mu=. (0{mdt)=<,y
  if. +./mu do.
    'path inuse'=. 2 3{mu #"1 mdt
    NB. errmsg: dictionary in use - cannot unregister
    if. inuse do. jderr ERR018 return. end.
    newmdt=. (-.mu) #"1 mdt
    if. badrc msg=. markmast 1 do. msg return. end.
```

```
if. badreps ((<newmdt),<mdt) jreplace JMASTER;CNMFTAB,CNMFTABBCK do.
  jdmasterr ERR017 return.  NB. errmsg: jfile replace error
end.
if. badrc msg=. markmast~0 do. msg return. end.
(ok OK001),y;jpathsep path
else.
  jderr ERR005
end.
else.
  jderr ERR001
end.
)
```

```
remast=: 3 : 0
```

*NB.*remast v-- clears all in use bits in the master file. When
NB. JOD opens a dictionary an in use bit is set in the master
NB. file. When the dictionary is closed the bit is cleared. When
NB. the in use bit is set the dictionary cannot be opened
NB. read/write by other dictionary tasks.*

NB.

NB. monad: remast paMeAll

NB.

NB. remast 0 NB. reset all

NB. remast 1 NB. reset me

```
mdt=. > jread JMASTER;CNMFTAB
```

```
if. 0=y do.
```

```
    NB. reset all
    mdt=. (<"0 ({:$mdt)#0) 3} mdt
else.
    NB. reset me
    mdt=. (<0) (<3;I. (;3{mdt) e. readobid obidfile 0)}mdt
end.
(<mdt) jreplace JMASTER;CNMFTAB
)

restd=: 3 : 0

NB.*restd v-- restores the most recent backup created by (packd).
NB.
NB. monad:  restd cl
NB.
NB.  restd 'backup'

NB. NIMP: packd/restd not supported on iOS/Android devices for now
NB. if. badrc uv=. checksup 'restd' do. uv return. end.

NB. only put dictionaries can be restored
if. badrc uv=. checkpoint__ST 0 do. uv return. end.
DL=. 1 { uv NB. directory object !(*)=. DL

NB. is there enough space on the dictionary volume?
if. badrc uv=. restspace__DL 0 do. uv else. (}. uv) restdict__DL y end.
)
```

```
NB. ok return value
rv=: >@{1&{)

rxs=: ''&$: :(4 : 0)

NB.*rxs v-- regular expression search.
NB.
NB. monad: rxs blclNames
NB.
NB. NB. display all WORD regx search text
NB. NB. '' rxs }. dnl 're'
NB.
NB. rxs }. dnl 're'
NB.
NB. dyad: (clPatten ; ilCodes) rxs blclNames
NB. clPattern rxs blclNames

NB. do we have a dictionary open?
if. badrc uv=. checkopen__ST 0 do. uv return. end.

NB. (x) is either cl or (cl ; il) errmsg: invalid option(s)
msg=. ERR001
if. 1 < L. x do. jderr msg return. end.
if. 0 = L. x do. x=. x ; WORD,DEFAULT,1
else.
  if. (1 ~: $$,x) *. 2 ~: #,x do. jderr msg return. end.
end.
```

NB. regular expression and object options

```
'pat opts'=. x
if. badcl pat do. jderr msg return. end.
if. badil opts do. jderr msg return. end.
```

NB. format options HARDCODE: codes and positions

```
opts=. opts , (-3-#opts) {. DEFAULT , 1
if. -. 1 2 3 e.~ {: opts do. jderr msg return. end.
```

```
if. DICTIONARY=0{opts do.
```

NB. no short and long texts for dictionary documents

```
if. DEFAULT ~: 1{opts do. jderr msg return. end.
```

NB. tolerate any (y) for dictionary text case

```
uv=. opts rxsgot 0
```

```
else.
```

NB. are names valid?

```
if. badrc y=.checknames y do. y return. else. y=. }.y end.
```

NB. remove nouns - they are not searched for patterns

NB. return nothing found if all names are nouns

```
if. WORD = 0{opts do.
```

```
if. badrc uv=. (WORD,INCLASS) invfetch__ST y do. uv return. end.
```

```
if. 0 = #y=. y #~ 0 ~: >1{uv do. ok <0 2$<' ' return. end.
```

```
end.
```

```
if. badrc uv=. opts rxsgget y do. uv return. end.  
end.
```

NB. empty patterns mean return all nonempty text to be searched

NB. handy for complex pattern debugging and verification

```
if. #pat do. (pat;opts) rxsssearch >1{uv else. uv end.  
)
```

```
rxsgget=: 4 : 0
```

*NB.*rxsgget v-- retrieves text objects from dictionary database*

NB. files.

NB.

NB. A variation of (get) that only retrieves text objects from

NB. dictionary database files. (rxsgget) returns the texts that

NB. are searched for regular expression patterns by (rxs).

NB.

NB. Note: binary objects (nouns) are eliminated from the name

NB. list (y) by the caller of this verb.

NB.

NB. dyad: ilCodes rxsgget bluu

NB.

NB. 2 8 1 rxsgget 'GroupName'

NB. 4 7 1 rxsgget 'MacroText'

```
msg=. ERR001 NB. errmsg: invalid option(s)
```

```
select. {. x
```

```
case. WORD do.  
  select. second x  
    case. DEFAULT do. txt=. (WORD,0) getobjects__ST y  
    case. EXPLAIN do. txt=. WORD getexplain__ST y  
    case. DOCUMENT do. txt=. WORD getdocument__ST y  
    case.do. jderr msg return.  
  end.  
case. TEST do.  
  select. second x  
    case. DEFAULT do. txt=. (TEST,0) getobjects__ST y  
    case. EXPLAIN do. txt=. TEST getexplain__ST y  
    case. DOCUMENT do. txt=. TEST getdocument__ST y  
    case.do. jderr msg return.  
  end.  
case. GROUP do.  
  select. second x  
    case. DEFAULT do. txt=. GROUP getgstext__ST y  
    case. EXPLAIN do. txt=. GROUP getexplain__ST y  
    case. DOCUMENT do. txt=. GROUP getdocument__ST y  
    case.do. jderr msg return.  
  end.  
case. SUITE do.  
  select. second x  
    case. DEFAULT do. txt=. SUITE getgstext__ST y  
    case. EXPLAIN do. txt=. SUITE getexplain__ST y  
    case. DOCUMENT do. txt=. SUITE getdocument__ST y  
    case.do. jderr msg return.
```



```
end.
case. MACRO do.
  select. second x
    case. DEFAULT do. txt=. (MACRO,0) getobjects__ST y
    case. EXPLAIN do. txt=. MACRO getexplain__ST y
    case. DOCUMENT do. txt=. MACRO getdocument__ST y
    case.do. jderr msg return.
  end.
case. DICTIONARY do.
  select. second x
    case. DEFAULT do. txt=. getdicdoc__ST 0
    case.do. jderr msg return.
  end.
case.do. jderr msg return.
end.

if. badrc txt do. txt
else.
  NB. form two column (name,text) table remove 0 length texts
  if. badcl txt=. >1{txt do.
    txt=. (0,<{:{$txt) {"1 txt
    ok <txt #~ 0 < #&> 1 {"1 txt
  else.
    NB. dictionary documentation case often empty - only unnamed text
    ok <((0<#txt),2)$';txt
  end.
end.
```

```
)

rxssearch=: 4 : 0

NB. *rxssearch v-- search (name, text) table for regex matches.
NB.
NB. dyad: (clPat ; ilOpts) rxssearch btNameText

NB. all arguments validated by callers
'pat opts'=. x

NB. require 'regex' !(*)=. rxfirst rxall rxmatches
NB. HARDCODE: option codes
select. {:opts
case. 1 do.
  h=. pat&rxfirst&.> 1 {"1 y
  ok <((0 {"1 y) ,. h) #~ 0 < #&> h
case. 2 do.
  h=. pat&rxall&.> 1 {"1 y
  ok <((0 {"1 y) ,. h) #~ 0 < #&> h
case. 3 do.
  h=. pat&rxmatches&.> 1 {"1 y
  b=. 0 < #&> h
  ok <(b # 0 {"1 y) ,. (b # h) ,. b # 1 {"1 y
case.do. jderr ERR001
end.
)
```

```
saveobid=: 3 : 0
```

```
NB.*saveobid v-- saves the last n JOD object ids in the \jnxxx  
NB. directory. These globally unique values are used to reset any  
NB. dictionaries left open by JOD tasks spawned from the current  
NB. machine.
```

```
NB.
```

```
NB. monad: saveobid xiObid
```

```
NB.
```

```
NB. saveobid JODOBID
```

```
id=. ~. y , readobid file=.obidfile 0
```

```
NB. HARDCODE up to 30 last object ids spawned on this machine
```

```
NB. NOTE: if you run more than 30 JOD tasks on the current
```

```
NB. machine you will lose object id's which cause the RESETME
```

```
NB. option of (dpset) to not reset all dictionaries recently opened -
```

```
NB. but never closed - on this machine. JUST INCREASE THE NUMBER EHHH!!
```

```
((30<.#id) {. id) (writenoun :: _1:) file
```

```
)
```

```
NB. second list item
```

```
second=: 1&{
```

```
NB. J type code
```

```
tc=: 3!:0
```

NB. removes blanks from items on blcl

```
trimnl=: -.&' '>
```

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

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

```
tstamp=: 3 : 0
```

*NB.*tstamp v-- standard j 8_07 library timestamp.*

NB.

NB. A renamed version of the standard J 8.07 era timestamp. JOD

NB. used an earlier version of this verb, see (tstamp2), that did

NB. not handle all zero timestamps.

NB.

NB. monad: clDate =. tstamp il | fl

NB.

NB. tstamp '' NB. now timestamp

NB. tstamp 0 0 0 0 0 0 NB. zero stamp

```
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
```

```
meth=. _3[\ ' JanFebMarAprMayJunJulAugSepOctNovDec'
```

```
d=. ,((1 {"1 t) { meth) 3 4 5 {"1 d
```

```
d=. '0' (I. d=' ') } d
```

```
d=. ' ' (I. d='+') } d
```

```

(r,20) $ d
)

uses=: 3 : 0

NB.*uses v-- returns word references.
NB.
NB. monad:  uses blclName
NB.
NB.    NB. non-locale global word references
NB.    uses ;:'out global references please'
NB.
NB. dyad:    ilObjOpt uses clName
NB.
NB.    NB. global locale word references
NB.    11 uses ;:'out locale references'
NB.
NB.    0 31 uses 'wordname'  NB. uses union of word
NB.    0 32 uses '

0 uses y
:

if. badrc uv=. checkopen__ST 0 do. uv return. end.
if. badrc y=.checknames y do. y return. else. y=. }.y end.

msg=. ERR001 NB. errmsg: invalid option(s)
if. badil x do. jderr msg return. else. x=. '$x end.

```

```
if. x-:WORD do.
  if. badrc dat=.WORD getrefs__ST y do. dat return. end.
  dat=. rv dat
  dat=. (uv=. {"1 dat) ,. > {"1 dat
  NB. return in order requested
  ok <(("1 dat) i. y){dat
elseif. x-:UNION do.

  NB. word uses unions
  uv=. i. 0 0
  for_wrd. y do.
    srch=. '' [ refs=. wrd
    loc=. '' [ self=. 0
    while.do.
      if. badrc dat=.WORD getrefs__ST refs do. dat return. end.
      srch=. ~. srch , {"1 dat=. rv dat
      NB. only non-locale names are searched
      self=. self+. wrd e. new=. ~. ; {.&> {"1 dat
      new=. new -. srch
      loc=. ~. loc , (; {.&> {"1 dat) -. loc
      if. isempty new do. break. end.
      refs=. new
    end.
    srch=. /:~ srch -. self}. wrd
    uv=. uv, wrd, srch; <loc
  end.
```

```
ok <uv

elseif.do. jderr msg
end.
)

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. 1 when word with name exists 0 otherwise
wex=: 0&<:@:nc
```

NB. word storage representation - nouns binary others linear

```
wrep=: 5!:5@<`(3!:1@:". )@.(0&=@(nc@<))
```

NB. writes a list of bytes to file

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

NB. writes a J noun file

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


jodstore Source Code

*NB.*jodstore c-- storage object class: extension of (jod).*
NB.
NB. Hides the underlying database/file system used to store
NB. dictionary objects. Replacing this class is all that's
NB. required to change the dictionary storage system.
NB.
NB. Verb interface:
NB. bchecknames checks backup name patterns
NB. bgetdicdoc get backup versions of the dictionary document
NB. bgetexplain get backup versions of short object explanations
NB. bgetgstext get backup versions of group/suite headers
NB. bgetobjects get objects from backups
NB. bnlsearch searches put dictionary backup name lists for simple character list patterns
NB. bnums returns unique backup ordered list of dictionary backup numbers
NB. checkopen checks if any dictionary is open
NB. checkpath checks current path against dictionary path
NB. checkput checks if first path dictionary is a put dictionary
NB. closedict closes dictionaries
NB. createst initializes storage objects
NB. defwords define words
NB. delstuff delete objects
NB. didstats dictionary statistics and path information
NB. dnlsearch search for name patterns
NB. getdocument get object documentation
NB. getexplain get short object explanations

NB. *getgstext* *get group and suite script text*
NB. *getntstamp* *get name, creation and last put timestamps*
NB. *getobjects* *get objects*
NB. *getrefs* *get references*
NB. *gslistnl* *group and suite name lists*
NB. *inputdict* *test for objects in put dictionary*
NB. *invappend* *append inverted data*
NB. *invdelete* *delete inverted data*
NB. *invfetch* *fetch inverted data*
NB. *invreplace* *update inverted data*
NB. *newregdict* *create new or register dictionary*
NB. *opendict* *open a dictionary*
NB. *pathnl* *path name lists*
NB. *putexplain* *store short object explanations*
NB. *putgs* *store groups and suites*
NB. *putntstamp* *store name, creation and last put timestamps*
NB. *puttable* *store (name,text) and (name,class,text) tables*
NB. *puttexts* *store object documentation and group/suite texts*
NB. *putwords* *store words*
NB. *putwordxrs* *store word global references*
NB.

NB. *Notes:*

NB. *Error messages (jodstore range 050-149)*

```
coclass 'ajodstore'  
coinsert 'ajod'
```

*NB.*dependents x-- JODstore dependent defintions*

CNMARK=: 0 *NB. file component: count and timestamp mark*
CNLIST=: 4 *NB. file component: main object index list*
CNCOMPS=: 5 *NB. file component: main object component list*

NB. main directory file component list

CNDIR=: CNMARK,CNLIST,CNCOMPS

CNCLASS=: 6 *NB. file component: word name class or macro type*
CNCREATION=: 8 *NB. file component: when object was first created*
CNDICDOC=: 2 *NB. file component: dictionary documentation - (regd)*
CNEXPLAIN=: 11 *NB. file component: short explanations*
CNPARMS=: 3 *NB. file component: dictionary parameters*
CNPUTDATE=: 7 *NB. file component: last time object was (put)*
CNREF=: 5+i.2 2 *NB. reference component table*
CNRPATH=: 19 *NB. file component: reference path - (didnum) list*
CNSIZE=: 9 *NB. file component: size of object in bytes*

NB. inverted group and suite data file components

INVGROUPS=: CNPUTDATE,CNCREATION,CNEXPLAIN

INVSUITES=: INVGROUPS

NB. inverted macro and word data file components

INVMACROS=: CNCLASS,CNPUTDATE,CNCREATION,CNSIZE,CNEXPLAIN

INVWORDS=: INVMACROS

NB. inverted test data

INVTTESTS=: CNPUTDATE,CNCREATION,CNSIZE,CNEXPLAIN

NB. name.n or name.name separator character

NDOT=: '.'

NB. trim right (trailing) path delimiters !()=. PATHDEL*

rpdtrim=:] #~ [: -. [: *./\ . PATHDEL" _ =]

NB. split backup name pattern cl

splitbname=: (NDOT&beforestr ; NDOT&afterstr)

*NB.*enddependents*

*NB.*end-header*

NB. initial documentation list: latex ; html ; text

DOCINIT=: <;._1 ' ' ' '

ERR050=: 'no dictionaries open'

ERR051=: 'not a put dictionary ->'

ERR052=: 'unable to initialize ->'

ERR053=: 'word(s) do not exist ->'

ERR054=: 'unable to load directory'

ERR055=: 'directory-data inconsistency'

ERR056=: 'jfile replace failure'

ERR057=: 'directory update failure'

ERR058=: 'jfile append failure'

ERR059=: 'full rooted path required'

ERR060=: 'unable to create directory ->'

ERR061=: 'invalid dictionary name;path[;documentation]'

ERR062=: 'invalid characters in name'

ERR063=: 'invalid characters in path'

ERR064=: 'target drive is required'

ERR065=: 'not enough space on drive/volume ->'

ERR066=: 'dictionary name in use'

ERR067=: 'unable to create subdirectories'

ERR068=: 'unable to setup dictionary file(s)'
ERR069=: 'error updating master'
ERR070=: 'request exceeds open limit'
ERR071=: 'already open ->'
ERR072=: 'another task opened read/write ->'
ERR073=: 'missing dictionary file(s) ->'
ERR074=: 'cannot read dictionary parameters ->'
ERR075=: 'unable to open directory ->'
ERR076=: 'master-dictionary inconsistency - try (dpset) ->'
ERR077=: 'unable to update master'
ERR079=: 'unable to load references'
ERR080=: 'not open ->'
ERR081=: 'path mismatch'

ERR082=: 'unable to set reference path'

ERR083=: 'not on path ->'

ERR084=: 'unable to read data'

ERR085=: 'words(s) not defined ->'

ERR086=: 'not in put dictionary ->'

ERR087=: 'nothing in put dictionary'

ERR088=: 'jfile read failure'

ERR089=: 'text(s) to long'

ERR090=: 'file offset invalid'

ERR091=: 'definition failure'

ERR092=: 'duplicate dictionary id number'

ERR093=: 'directory damaged'

ERR094=: 'exceeds locale symbol table size - no words defined'

ERR095=: 'dictionary file attributes do not allow read/write ->'

ERR096=: 'linux/unix dictionary paths must be / rooted ->'

ERR097=: 'invalid dictionary document must be character list'

ERR098=: 'master/dictionary file path mismatch - name/DIDNUM ->'

ERR099=: 'invalid name/creation/lastput table'

ERR100=: 'name/creation/lastput length mismatch'

ERR101=: 'invalid date(s) name/creation/lastput table'

ERR102=: 'timestamp table shape invalid'

ERR103=: 'no backup(s) to restore or search'

ERR104=: 'no registered dictionaries'

ERR105=: 'unreadable or missing backup timestamp'

ERR106=: 'invalid backup number(s)'

ERR107=: 'not in backup(s) -> '

*NB. directory and reserved components in *.ijf files*

OFFSET=: 39

OK050=: 'dictionary created ->'

OK051=: ' word(s) put in ->'

OK052=: 'opened ('

OK054=: 'closed ->'

OK055=: ' explanation(s) put in ->'

OK056=: ' references put in ->'

OK057=: '(s) put in ->'

OK058=: 'dictionary registered ->'

OK059=: 'put in ->'

OK060=: ' word(s) defined'

OK061=: '(s) deleted from ->'

OK062=: 'dictionary document updated ->'

OK063=: '(DOCUMENTDICT = 0) - dictionary document not updated ->'

OK064=: ')' timestamps updated - ('

OK065=: ')' not in put ->'

NB. path report title

PATHTIT=: 'Path*'

NB. visible read status text

READSTATS=: < ; _1 ' ro rw'

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

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

NB. contains string in lists of list of names

allnlctn=: [/:~@:nlctn&.> [: <]

NB. match prefixes in lists of lists of names - (pathnl) related

allnlpfx=: [/:~@:nlpfx&.> [: <]

NB. match suffixes in lists of lists of names

allnlsfx=: [/:~@:nlsfx&.> [: <]

```
apptable=: 4 : 0
```

```
NB.*apptable v-- appends (name,text) and (name,class,text) tables to file.
```

```
NB.
```

```
NB. dyad: bl apptable bt
```

```
'ttype ixn cmn fp DL'=. x NB. directory object !(*)=. DL
```

```
sizes=. #&> {"1 y NB. sizes
```

```
pf=. PUTFACTOR__DL
```

```
NB. words and macros have class or type
```

```
if. wmt=. ttype e. WORD,MACRO do. class =. ; 1 {"1 y end.
```

```
texts=. y
```

```
cnall=. i.0
```

```
y=. {"1 y NB. no longer required
```

```
while. #texts do.
```

```
  cnt=. pf <. #texts
```

```
  tn=. cnt {"1 texts
```

```
  un0=. <"1 tn
```

```
  un1=. <"1 ({"1 tn) ,"0 1 DOCINIT
```

```
  if. badappend cn=. (, un0 ,. un1) jappend fp do.
```

```
    jderr ERR058 return. NB. errmsg: append failure
```

```
  else.
```

```
    cnall=. cnall , fod cn
end.

texts=. cnt }. texts
end.

NB. append directory and inverted lists
msg=. ERR057 NB. errmsg: directory update failure
if. (tc=. #y) ~: #cnall do. jderr msg return. end.

stamp=. tc#nowfd now ''
un0=. stamp;stamp;sizes;<tc#a:
un1=. CNPUTDATE,CNCREATION,CNSIZE,CNEXPLAIN

if. wmt do.
    dropnc__DL ttype NB. force class reload
    un0=. class;un0
    un1=. CNCLASS,un1
end.

if. badrc msg=. un0 invappend fp;un1 do. msg
else.
    NB. update directory
    y=.      (".ixn) , y
    cnall=. (".cnn) , cnall
    if. badrc (ttype,fp) savedir__DL y;cnall do. jderr msg else. ok tc end.
end.
```

```
)

appwords=: 4 : 0

NB.*appwords v-- appends new words in blocks of (PUTFACTOR).

'loc DL'=. x NB. directory object !(*)=. DL
wp=. WP__DL [ pf=. PUTFACTOR__DL
names=. y
lnames=. y ,&.> locsfx loc
size=. class=. cnall=. i.0

while. #names do.
  cnt=. pf <. #names
  wn=. cnt {. names [ lwn=. cnt {. lnames
  val=. wrep&.> lwn NB. word values
  bsz=. #&> val NB. NIMP word byte sizes (size testing)
  bnc=. nc lwn
  un0=. <"1 wn ,. (<"0 bnc) ,. val
  un1=. <"1 wn ,"0 1 DOCINIT

  NB. append words
  if. badappend cn=. (, un0 ,. un1) jappend wp do.
    jderr ERR058 return. NB. errmsg: append failure
  else.
    cnall=. cnall , fod cn
    size=. size , bsz
    class=. class , bnc
```

```
end.

names =. cnt }. names [ lnames =. cnt }. lnames
end.

NB. append directory and inverted lists
msg=. ERR057 NB. errmsg: directory update failure
if. (#y) ~: #cnall do. jderr msg return. end.
wc=. #y NB. number of words

stamp=. wc#nowfd now ''
un0=. class;stamp;stamp;size;<wc#a:
un1=. CNCLASS,CNPUTDATE,CNCREATION,CNSIZE,CNEXPLAIN NB. NIMP word append
if. badrc msg=. un0 invappend wp;un1 do. msg
else.
  NB. update word directory
  y=. WORDIX__DL , y
  cnall=. WORDCN__DL , cnall
  if. badrc (WORD,wp) savedir__DL y;cnall do. jderr msg else. ok wc end.
end.
)

backupdates=: 4 : 0

NB.*backupdates v-- scans put dictionary backup files and returns
NB. backup dates.
NB.
NB. This verb attempts to read component index 1 of put
```

```
NB. dictionary (jwords) backup files. The resulting data takes
NB. these possible forms.
NB.
NB. verbatim:
NB.
NB. 1. bnum,timestamp - pack count and timestamp
NB. 2. bnum,0        - pack count and 0
NB. 3. _1`           - jread error - probably an older unreadable binary
NB. 4. _2            - trapped jread error - serious problemas
NB.
NB. dyad:  bt =. blObj backupdates ilBnums
NB.
NB. NB. DL is put dictionary object
NB. NB. bnums is a list of put dictionary backup numbers
NB.
NB. DL backupdates bnums

NB. HARDCODE: component 1
uv=. >jread"1 (<1) ,.~ (<BAK__x) ,&.> (":&.> <"0 y) ,&.> 0{JDFILES
bstamps=. }. "1 uv [ bn=. 0 {"1 uv

NB. format timestamps
bstamps=. (<"0 bn) ,. <"1 tstamp"1 bstamps

NB. errmsg: unreadable or missing backup timestamp
bstamps=. (<ERR105) (<(I. 0>bn);1)} bstamps
)
```

```
NB. bad jfile components - first names do not match list
badcn=: [: -. [ -: [: {.&> ]

bchecknames=: 4 : 0

NB. *bchecknames v-- checks backup name patterns.
NB.
NB. dyad: ilObjBn bchecknames blclBnames
NB.
NB. NB. valid ordered put dictionary backup numbers
NB. bn=. rv_ajod_ checkback__ST__JODobj_1{0{DPATH__ST__JODobj
NB.
NB. NB. first item of (x) is a dictionary object code
NB. (WORD,bn) bchecknames__ST__JODobj <:._1' booo hhh re.12 bx.14 er.99'
NB.
NB. NB. names are not required for the special DICTIONARY case
NB. (DICTIONARY,bn) bchecknames__ST__JODobj <:._1' .71 .73 .65'

NB. errmsg: invalid name pattern(s)
if. +./ badcl&> y do. jderr ERR010 return. end.

NB. split backup name patterns
nbk=. (splitbname&> y) -.&> ' '

NB. if backup number is absent use most recent
nbk=. (<":1{x) (<(I. 0 = #&> 1 {"1 nbk);1)} nbk

NB. names must be valid
```



```
if. DICTIONARY = 0{x do. bnm=. 0 {"1 nbk
elseif. badrc bnm=. checknames 0 {"1 nbk do. bnm return.
elseif.do. bnm=. }.bnm
end.

NB. backup numbers must be valid
if. 0 e. (1 {"1 nbk) *./@e.&> <DIGITS do. jderr ERR106 return. end.
bn=. , _1&".&> 1 {"1 nbk

NB. errmsg: invalid backup number(s)
if. 0 e. bn e. x do. jderr ERR106 return. end.

NB. return unique checked names and backup numbers
ok <~.bnm ,. <"0 bn
)

bgetdicdoc=: 3 : 0

NB.*bgetdicdoc v-- get backup versions of the dictionary document.
NB.
NB. monad: bgetdicdoc btNameBn

NB. there is only one document per dictionary unique
NB. dictionary backup numbers insure no redundant file reads
bn=. ~.1 {"1 y

NB. put dictionary object !(*)=. doj
doj=. {:{.DPATH
```

NB. dictionary document results combine dictionary name

NB. with backup numbers to differentiate versions

NB. NOTE: the resulting label may not be a valid J name

NB. unless the JOD dictionary name is a valid J name.

```
ro=. ((<DNAME__doj) ,&.> '_' ,&.> ":%&.> bn) ,. a:
```

NB. backup path and file suffix

```
'pth fsx'=. bpathsfx WORD
```

```
ubn=. ;bn
```

```
for_bob. ubn do.
```

```
fn=. pth,(":bob),fsx NB. backup file
```

NB. read document component

```
if. badjr dat=. jread fn;CNDICDOC do. jderr ERR088 return. end.
```

NB. update results

```
ro=. dat (<(I. bob=ubn);1)} ro
```

```
end.
```

NB. insure any empty documents have literal datatype

```
ok <btextlit ro
```

```
)
```

```
bgetexplain=: 4 : 0
```

```
NB.*bgetexplain v-- get short explanations from backups.
NB.
NB. dyad: il bgetexplain btNameBn

NB. object names
nnm=. 0 {"1 y [ obj=. 0{x

NB. results are boxed name literal value tables
ro=. nnm ,. <,' '

'pth fsx'=. bpathsfx obj

NB. fetch backup objects by backup number - optimizes file reads
cpm=. CNLIST,CNEXPLAIN
ubn=. ~.bn=. ; 1 {"1 y
for_bob. ubn do.

    fn=. pth,(":bob),fsx NB. backup file

    NB. read backup explanations errmsg: read failure
    if. badjr 'ixn sex'=. jread fn;cpm do. jderr ERR088 return. end.

    NB. explanations must exist in backup(s) errmsg: not in backups ->
    sn=. nnm {~ rx=. I. bob=bn
    if. 0 e. uv=. sn e. ixn do. (jderr ERR107),(sn #~ -.uv) ,&.> <NDOT,":bob return. end.
```

```
NB. update results
ro=. (sex {~ ixn i. sn) (<rx;1)} ro

NB. distinguish object names with backup number suffix
ro=. (((<rx;0){ro) ,&.> <'_' ,":bob) (<rx;0)} ro

end.

NB. insure any empty explanations have literal datatype
ok <btextlit ro
)

bgetgtext=: 4 : 0

NB.*bgetgtext v-- get backup versions of group/suite headers.
NB.
NB. dyad: il bgetobjects btNameBn

if. badrc uv=. (x,0) bgetobjects y do. uv else. ok <0 1 {"1 rv uv end.
)

bgetobjects=: 4 : 0

NB.*bgetobjects v-- get objects from backups.
NB.
NB. dyad: il bgetobjects btNameBn
```

NB. object code, offset and names

```
nnm=. 0 {"1 y [ 'obj offset'=. x
```

NB. HARDCODE: 2 indicates fetching group/suite list(s)

```
offset=. (bgslist=. offset=2){offset,0
```

NB. results are boxed name value tables

NB. words & macro have three columns

```
ro=. nnm ,"0 1 (1 + (offset=0) * obj e. WORD,MACRO)$a:
```

NB. HARDCODE: result columns

```
cols=. 0 _1
```

```
if. (0=offset) *. -.bgslist do. cols=. i. {:$ro end.
```

NB. backup path and file suffix

```
'pth fsx'=. bpathsfx obj
```

NB. fetch backup objects by backup number - optimizes file reads

```
cpm=. CNLIST,CNCOMPS
```

```
ubn=. ~.bn=. ; 1 {"1 y
```

```
for_bob. ubn do.
```

```
fn=. pth,(":bob),fsx NB. backup file
```

NB. read backup directory index errmsg: read failure

```
if. badjr 'ixn ixc'=. jread fn;cpm do. jderr ERR088 return. end.
```

```
NB. objects must exist in backup(s) errmsg: not in backups ->
sn=. nnm {~ rx=. 1. bob=bn
if. 0 e. uv=. sn e. ixn do. (jderr ERR107),(sn #~ -.uv) ,&.> <NDOT,":bob return. end.

NB. read object components
if. badjr dat=. jread fn;offset+(ixn i. sn){ixc do. jderr ERR088 return. end.

NB. update results
ro=. (cols {"1 >dat) rx} ro

NB. distinguish object names with backup number suffix
ro=. (((<rx;0){ro) ,&.> <'_' ,":bob) (<rx;0)} ro

end.

NB. for nonwords insure any empty texts have literal datatype
if. obj~:WORD do. ro=. btextlit ro end.

ok <ro NB. return object table
)

bnlsearch=: 4 : 0

NB.*bnlsearch v-- searches put dictionary backup name lists for
NB. simple character list patterns.
NB.
NB. dyad: ilObjOptNc bnlsearch clPattern
```

NB. at most one '.' character errmsg: invalid name pattern

```
if. 1 < +/ y e. NDOT do. jderr ERR010 return. end.
```

NB. maintains argument compatibility with (dnl)

```
bv=. DEFAULT ~: 2{x
```

```
if. bv *. (0{x) e. TEST, GROUP, SUITE do. jderr ERR001 return. end.
```

NB. put dictionary directory object

```
DL=. {:0{DPATH
```

NB. extant backup numbers errmsg: no backup(s) to restore or search

```
if. badrc uv=. checkback DL do. uv return. else. bn=. rv uv end.
```

NB. search name pattern and requested backup

```
'pat rbk'=. splitbname y
```

NB. use most recent backup if none specified

```
if. isempty rbk do. rbk=. {.bn
```

```
elseif. 0 e. rbk e. DIGITS do. jderr ERR010 return.
```

```
elseif. -. (rbk=. ".rbk) e. bn do. jderr ERR103 return.
```

```
end.
```

NB. nonempty patterns must be valid J names without embedded locales

```
if. #uv=. pat -. ' ' do.
```

```
  if. badrc uv=. checknames pat do. uv return. end.
```

```
end.
```

```
bdot=. (,NDOT)-:alltrim y

if. bdot *. INPUT={.x do.

    NB. show pack/backup dates
    ok <DL backupdates bn

elseif. bdot do.

    NB. return backup suffixes
    dot=. (0<#bn){';NDOT
    ok dot ,&.> 'r<0>0.d' 8!:0 bn

elseif. bfile=. ({.x) dbakf__DL rbk
    NB. errmsg: jfile read failure

    badjr uv=. jread bfile;(1{CNDIR),CNCLASS do. (jderr ERR088,' ->'),<bfile

elseif.
    ol=. uv{ol [ uv=. /: ol [ 'ol oc'=. uv
    NB. reduce object list for words and macros if class specified
    if. bv *. (0{x) e. WORD,MACRO do. ol=. (oc = 2{x)#ol [ oc=. uv{oc end.

    isempty pat do. ok ol NB. return sorted last backup name list

elseif. 0=#ol do. ok ol NB. nothing left to match
elseif. do. NB. match prefix, infix suffix
```



```
select. 1{x
  case. 1 do. ok ol nlpfx pat
  case. 2 do. ok ol nlctn pat
  case. 3 do. ok ol nlsfx pat
  case. do. jderr ERR010
end.
end.
)
```

```
bnums=: 3 : 0
```

```
NB.*bnums v-- returns unique backup ordered list of dictionary
NB. backup numbers.
```

```
NB.
```

```
NB. monad: il =. bnums clPath
```

```
NB.
```

```
NB. bnums BAK NB. (BAK) directory object noun
```

```
NB. requires first character of all (JDFILES) to be the same
```

```
\:~ ~. , ". ({.;JDFILES)&beforestr&> {."1 (1!:0) <y,'*',IJF  
)
```

```
bpathsfx=: 3 : 0
```

```
NB.*bpathsfx v-- backup file path and file name suffix.
```

```
NB.
```

```
NB. monad: (clPath ; clSfx) =. bpathsfx iaObj
```

```
NB.
NB.  NB. calls in object context
NB.  bpathsfx__ST__JODobj WORD_ajod_
NB.  bpathsfx__ST__JODobj MACRO_ajod_

doj=. {:{:DPATH          NB. put dictionary object
fsx=. (;y{JDFILES),IJF  NB. backup file name suffix

NB. backup file path !(*)=. doj
pth=. ". ({.;dncn__doj y),'P__doj'
pth=. (>:pth i: PATHDEL) {. pth

NB. return path and suffix
(pth , (;{:JDSDIRS) , PATHDEL);fsx
)

btextlit=: 3 : 0

NB.*btextlit v-- force any empty backup text to literal datatype.
NB.
NB. To insure that (ed) can always edit (bget) backup name value
NB. tables force any empty texts to a literal datatype. If this is
NB. not done the result may fail the name, value argument tests
NB. of (ed).
NB.
NB. monad:  bt =. btextlit bt
```

```
(<'') (<(I. 0 = #&> _1 {"1 y");_1}) y  
)
```

```
checkback=: 3 : 0
```

```
NB.*checkback v-- return list of put dictionary backup numbers.
```

```
NB.
```

```
NB. monad: ilbn checkback baObj
```

```
NB.
```

```
NB.    checkback {:0{DPATH
```

```
NB. extant backup numbers errmsg: no backup(s) to restore or search
```

```
if. 0=#bn=. bnums BAK__y do. jderr ERR103 else. ok bn end.
```

```
)
```

```
checkntstamp=: 3 : 0
```

```
NB.*checkntstamp v-- checks name, creation and last put date
```

```
NB. arrays.
```

```
NB.
```

```
NB. The boxed timestamp array fetched by the _14 option of (get)
```

```
NB. is one of the most complex and idiosyncratic JOD results. The
```

```
NB. layout was motivated by the need to serialize timestamp
```

```
NB. information so that dump scripts might preserve the creation
```

```
NB. and last put date of objects.
```

```
NB.
```

```
NB. monad: checkntstamp btNts
```

```

NB.
NB.   'rc nts'=. 0 _14 get }. dnl ''
NB.   checkntstamp__ST__JODobj nts

msg=. ERR099 NB. errmsg: invalid name/creation/lastput table
if. badbu y do. jderr msg
elseif. -.2 1 -: $y      do. jderr msg
elseif. badfl uv=. ;1{y do. jderr msg
elseif. (2 ~: #uv) +. 2 ~: #uv do. jderr msg
NB. errmsg: name creation/lastput length mismatch
elseif. ~:/ {:@$$> y do. jderr ERR100
NB. creation must precede or equal last put
elseif. 0 e. <:/ uv do. jderr msg
elseif. badrc tn=. checknames ;0{y do. jderr msg
NB. timestamp names must be unique
elseif. badunique tn=. }.tn do. jderr msg
NB. dates are in fractional day yyyyymmdd.f d format
NB. check that floored numbers are actual Gregorian dates
NB. errmsg: invalid date(s) name/creation/lastput table
elseif. 0 e. valdate datefrnum ,uv do. jderr ERR101
elseif.do. ok < (<tn) (<0;0)} y NB. insures deblanked names
end.
)

checkopen=: 3 : 0

NB.*checkopen v-- are any dictionaries open?
NB.

```

NB. monad: checkopen uuIgnore

```
if. #DPATH do. OK else. jderr ERR050 end. NB. errmsg: no dictionaries open
)
```

```
checkpath=: 3 : 0
```

*NB.*checkpath v-- returns ok if the current path matches the
NB. current dictionary's reference path. Path matching is
NB. critical to the integrity of groups and suites.*

NB.

NB. monad: checkpath back

NB.

NB. checkpath <'6' NB. directory object reference

```
DL=. y NB. directory object !(*)=. DL
```

```
rpath=. ,RPATH__DL
```

```
dpath=. ,> 1 {"1 DPATH
```

```
if. #rpath do.
```

```
  if. rpath -: dpath do. OK else. jderr ERR081 end. NB. errmsg: path mismatch
else.
```

NB. dictionary path empty save current path and return ok

```
if. badreps (<dpath) jreplace UF__DL;CNRPATH do.
```

```
  jderr ERR082 NB. errmsg: unable to set reference path
```

```
else.
```

```
  RPATH__DL=: dpath
```

```
    OK
end.

end.
)

checkpoint=: 3 : 0

NB.*checkpoint v-- is the first path dictionary a read/write
NB. dictionary?
NB.
NB. monad: checkpoint uuIgnore

if. #DPATH do.
    DL=. 3{0{DPATH NB. directory object !(*)=. DL

    NB. return directory object reference or errmsg: not a put dictionary
    if. RW__DL do. ok DL else. (jderr ERR051),<DNAME__DL end.
else.
    jderr ERR050
end.
)

closedict=: 4 : 0

NB.*closedict v-- closes dictionaries. Dictionary names have been
NB. validated prior to calling this verb. Destroys all directory
```

*NB. objects. The state of directories on file are maintained by
NB. other verbs. So no directory updating is required here.*

NB.

NB. monad: closedict blclDictionary

NB.

NB. closedict 'd0';'d1' NB. close di

NB. close request seems valid - mark master

if. badrc msg=. markmast 1 do. msg return. end.

NB. destroy open directory objects

uv=. ({."1 DPATH) e. y

if. +./uv do.

coerbase"0 uv#{."1 DPATH

DPATH=: DPATH #~ -. uv

else.

(jderr ERR080),<y NB. errmsg: not open

end.

NB. update master open status and release

x=. > x

uv=. (0{x) i. y

x=. < (<0) (<3;uv)} x

if. badreps x jreplace JMASTER;CNMFTAB do.

jdmasterr ERR077 NB. errmsg: unable to update master

elseif. badrc msg=. markmast~0 do. msg

elseif. do. (ok OK054),y

```
end.
```

```
)
```

```
createst=: 3 : 0
```

```
NB.*createst v-- storage object creation verb. (y) is the object
```

```
NB. locale reference returned by (conew).
```

```
NB.
```

```
NB. monad: createst uuIgnore
```

```
NB.
```

```
NB.   createst__ST ST;MK;UT;<SO
```

```
NB. object references !(*)=. JOD ST MK UT SO
```

```
'JOD ST MK UT SO'=: y
```

```
NB. word and macro type/name class codes !(*)=. HASTYPE
```

```
HASTYPE=: (i. 4),MACROTYPE
```

```
NB. brand storage object with unique id !(*)=. JODOBID
```

```
saveobid JODOBID=: didnum 0
```

```
NB. inverted data/code component cross reference !(*)=. INCNXR
```

```
uv=. CNCLASS,CNCREATION,CNPUTDATE,CNSIZE
```

```
1 [ INCNXR=: (INCLASS,INCREATE,INPUT,INSIZE) ,: uv
```

```
)
```

```
defwords=: 4 : 0
```



```
NB.*defwords v-- fetches and defines words.
NB.
NB. dyad:  bac1 defwords blcl
NB.
NB.    (<'base') defwords ;:'please define my words'

if. badrc y=. checknames y do. y return. end.
wrds=. y=. }.y

NB. if all words are not on path get nothing
if. badrc wnl=. pathnl WORD do. wnl return. end.
wnl=. }. wnl

NB. errmsg: exceeds symbol table limit for locale
if. SYBOLLIM <: #wnl do. jderr ERR094 return. end.

NB. remove any empty dictionaries from path
b=.    0&<@:#&> wnl
wnl=. b#wnl [ dpath=. b#DPATH

if. */b=. y e. ; wnl do.

    loc=. locsfx x

NB. run down the path fetching the first word occurrences
for_dp. wnl do.
    ix=. (dp=. >dp) i. y
```

```
NB. if any words in current dictionary load them
if. +./wf=. ix<#dp do.
  if. badrc msg=. (wf#ix) loadwords loc,{:dp_index{dpath do.
    msg return.
  end.
end.

NB. remove fetched words from list quit if no more words
if. 0=#y=. (-.wf)#y do. break. end.
end.
end.

NB. test name class of fetched words
if. 1&e. b=. 0&> nc wrds=. wrds,&.>loc do.
  (jderr ERR085),b#wrds NB. errmsg: words(s) not defined
else.
  ok (":#b),OK060
end.

else.
  (jderr ERR083),(-.b)#y NB. errmsg: not on path
end.
)

delstuff=: 4 : 0

NB.*delstuff v-- deletes words, tests, groups, suites and macros
NB.
```

```
NB. dyad: (iaObject ; il ; bacl) delstuff blcl
NB.
NB.   cn =. CNPUTDATE,CNCREATION,CNEXPLAIN
NB.   (GROUP;cn;<DL) delstuff ;:'we groups are toast'

'obj cn DL'=. x NB. directory object !(*)=. DL

if. badrc y=. checknames y do. y
elseif. loaddir__DL obj do.
  jderr ERR054 NB. errmsg: unable to load directory
elseif. #ix =. "(>dnix__DL obj),'__DL' do.

  oc=. +/b=. ix e. y=. ~.}.y

  if. oc ~: #y do.
    (jderr ERR086),(-.y e. ix)#y NB. errmsg: not in put dictionary
    return.
  end.

  list=. (b=. -.b)#ix
  comp=. b#".(in=. >dnxn__DL obj),'__DL'
  fp=. dfopen__DL in=. {.in

  NB. remove old inverted data from object
  dropinv__DL 0

  NB. delete from inverted lists and main directory
```

```
if. badrc msg=. b invdelete fp;cn do.
  msg [ dfclose__DL in return.
elseif. badrc msg=. (obj,fp) savedir__DL list;comp do.
  msg [ dfclose__DL in return.
end.

NB. remove any put dictionary word references
if. WORD=obj do.
  if. badrc msg=. DL delwordrefs y do. msg [ dfclose__DL in return. end.
end.

dfclose__DL in
msg=. ' ',>dnm__DL obj
(ok (": oc),msg,OK061),<DNAME__DL

elseif.do.
  jderr ERR087 NB. errmsg: nothing in put dictionary
end.
)

delwordrefs=: 4 : 0
```

*NB.*delwordrefs v-- deletes word references. Word reference
NB. deletion is required when deleting words to insure that words
NB. do not leave "reference shadows." A reference shadow occurs
NB. when a word with references is deleted and moved to a
NB. dictionary further down on the path. The reference reporting
NB. mechanism picks up the shadow and never fetches the actual*

```
NB. reference list. Words are the only JOD objects with stored
NB. references.
NB.
NB. dyad:  ba delwordrefs blclWords

DL=. x NB. directory object !(*)=. DL

NB. errmsg: unable to load references
if. loadref__DL WORD do. jderr ERR079
elseif.do.

  NB. find any references to deleted words
  uv=. WORDPREFIX__DL e. y
  if. +./uv do.

    dfopen__DL 'U'
    fp=. UP__DL

    NB. remove any references from put dictionary
    uv1=. (uv=. -.uv)#WORDPREFIX__DL
    uv2=. uv#WORDREFCN__DL

    NB. update reference directory and close
    if. badrc msg=. (WORD,fp) saveref__DL uv1;uv2 do. msg [ dfclose__DL 'U' return. end.

    dfclose__DL 'U'
  end.
```

```
    OK
end.
)

didstats=: 4 : 0

NB.*didstats v-- dictionary statistics. Returns a table of object
NB. counts and reference paths for each dictionary in path order.
NB.
NB. dyad: uuIgnore didstats uuIgnore

NB. are any dictionaries open?
if. badrc uv=. checkopen 0 do. uv return. end.

NB. gerund of directory object (loadstamps) calls
ger=. (<'loadstamps') ,&.> locsfx ol=. {"1 DPATH
if. +./(ger `:0) 0 do.
    jderr ERR054 NB. errmsg: unable to load directory
else.
    dn=. DIRTS__oj [ oj=. {"1 DPATH NB. (*)=. oj
    hd=. '' ; '--' ; HEADNMS__oj

NB. collect values of directory object nouns
uv=.('RW';'RPATH';dn) fullmonty&><ol
rpaths=. 1{uv [ rs=. (;{.uv){READSTATS
dt=. ({."1 DPATH) ,. rs ,. {"&> |: 2 }. uv
dt=. hd , dt
```

```
NB. read master to get as complete a list of names and numbers
NB. as possible. Some (DIDNUM)'s may still be missing - missing
NB. dictionaries reported as dictionary numbers - hey life is cruel!
if. badjr uv=. jread JMASTER;CNMFTAB do.
  jderr ERR006 return. NB. errmsg: cannot read master
end.

rb=. <"0 (~. ;rpaths) -. ;1{uv =. >uv
hd=. (0{uv) , ":%> rb NB. all dictionary names
dn=. (1{uv) , rb NB. dictionary numbers

NB. display formatted paths with each dictionary using current names
rpaths=. ;&.>PATHSHOWDEL,L:0((<;dn)i.&.>rpaths){&.><hd
ok <dt ,. PATHTIT ; rpaths
end.
)

dnlsearch=: 4 : 0

NB.*dnlsearch v-- searches dictionary name lists for simple
NB. character list patterns.
NB.
NB. dyad: ilObjOptNc dnlsearch (clPattern ; clDir)
NB.
NB. 3 2 7 dnlsearch 'boo' NB. suite names containing 'boo'
NB. 3 _2 0 dnlsearch 'boo' NB. nouns with names containing 'boo'
```

```

mop=. ERR001
if. -(second x) e. PATOPS do. jderr mop return. end.

NB. following code is essentially (pathnl) - maintained
NB. inline because (pob) and (oj) used elsewhere
pob=. {:"1 DPATH [ dt=. |{:x
if. badrc msg=. dt loadalldirs pob do. msg return. end.
nl=. (>dnix__oj dt) fullmonty pob [ oj=. {pob NB. (*)=. oj

if. DEFAULT~:{:x do.
  NB. object noun !(*)=. HASTYPE
  if. (({:x) e. WORD,MACRO) *. ({:x) e. HASTYPE do.
    ger=. (<'loadnc') ,&.> locsfx pob
    if. +./(ger `:0) dt do.
      jderr ERR054 return. NB. errmsg: unable to load directory
    end.
    dc=. ;&.> (>dnnc__oj dt) fullmonty pob

    NB. remove items of (nl) that do not have type ({:x)
    nl=. (dc =&.> <{:x) #&.> nl

  else.
    jderr mop return.
  end.
end.

x=. second x

```



```

if. isempty y do.
  if. 0>x do. ok (/:~)&.> nl return. else. ok sortdnub nl end.
elseif. do.
  y=. ,y
  NB. insure nulls behave
  sublists=. 0>x
  shape=. (sublists#0),0
  nl=. (<shape$'') (I. 0=#&> nl)} nl
  NB. remove any empties
  if. 0=#nl=. nl -. a: do. ok'' return. end.
  select. |x
    case. 1 do. if. sublists do. ok nl allnlpfx y else. ok nl nubnlpfx y end.
    case. 2 do. if. sublists do. ok nl allnlctn y else. ok nl nubnlctn y end.
    case. 3 do. if. sublists do. ok nl allnlsfx y else. ok nl nubnlsfx y end.
    case. do. jderr mop
  end.
end.
)

```

NB. select only duplicate names in table based on first column
 dupnames=:] #~ (0 {"1]) e. (0 {"1]) #~ [: -. [: ~: 0 {"1]

freedisk=: 3 : 0

*NB.*freedisk v-- returns free disk/volume space in bytes.*
NB.
NB. monad: freedisk clDisk / clLinuxVolume

NB.
NB. freedisk 'c:\' NB. :\ required for windows
NB. freedisk '/sd1/dev' NB. linux file system root - null sums all devices

NB. NOTE: assume enough space for IOS, Android and unknown?

NB. Default behaviour has been changed to not size volumes
NB. when FREESPACE is 0. Volume sizing can perform poorly
NB. on large network volumes and fail completely on cloud drives.
NB. Empty JOD dictionaries are small (<60k) - assuming sufficient
NB. space is safe in all but extreme circumstances.

```
if.      0=FREESPACE      do. 1
elseif. IFWIN             do. freediskwin y
elseif. UNAME-:'Linux'    do. freedisklinux y
elseif. IFIOS            do. >:FREESPACE
elseif. UNAME-:'Darwin'   do. freediskmac y
elseif. UNAME-:'Android' do. >:FREESPACE
elseif.do. >:FREESPACE
end.
)
```

freedisklinux=: 3 : 0

NB.*freedisklinux v-- bytes free on not 'none' linux volumes.
NB.
NB. NOTE: NIMP: I don't know how to determine which
NB. linux volume the dictionary will be on so I return
NB. the minimum of all not 'none' mounted volumes.

```

NB.
NB. monad: fl =. freedisklinux uuIgnore
NB.
NB.   freedisklinux 0   NB. bytes (possibly floating) free on mounted filesystems

NB. linux shell command fetches free 1k blocks - expected format is:
NB. Filesystem          1K-blocks      Used Available Use% Mounted on
NB. /dev/sda1           149301564  11113004 130604408   8% /
NB. none                764396      648    763748   1% /dev
NB. none                771004      1364    769640   1% /dev/shm
NB. none                771004        96    770908   1% /var/run
NB. none                771004         0    771004   0% /var/lock
txt=. host 'df -l'

NB. cut into lines and drop header
txt=. }. < ; . _2 txt

NB. remove all 'none' filesystems HARDCODE: length of 'none'
NB. NIMP: ignoring empty result - hey there
NB. has to be at least one mounted filesystem!
txt=. txt #~ -. 'none'&-:&> 4 {.&.> txt

NB. min bytes free using 1000 byte blocks - this will
NB. underestimate free space and leave a little safety cushion
<./ 1000 * 3 {"1 ] _1&".&> txt
)

freediskmac=: 3 : 0

```

*NB.*freediskmac v-- free disk bytes on mac dictionary volume.*

NB.

NB. monad: iaBytes =. freediskmac clMacVolume

NB. NIMP: assume enough space for now

>:FREESPACE

)

freediskwin=: 3 : 0

*NB.*freediskwin v-- returns free disk/volume space in bytes for win systems*

NB.

NB. monad: freediskwin clDisk / clLinuxVolume

NB.

NB. freediskwin 'c:\' NB. :\ required for windows

*s=. 'kernel32 GetDiskFreeSpaceA i *c *i *i *i *i' cd y;(,0);(,0);(,0);(,0)*

**/ ; 2 3 4 { s*

)

NB. returns lists of directory object noun values - see long documentation

fullmonty=: [: ".&.> ([: < [] ,&.> [: locsfx]

getdicdoc=: 3 : 0

*NB.*getdicdoc v-- fetches put dictionary documentation.*

```
NB.
NB. monad: cl =. getdicdoc uuIgnore

NB. assumes a put dictionary is open.
DL=. {:{.DPATH NB. directory object !(*)=. DL
if. badjr dat=. jread WP__DL;CNDICDOC do. jderr ERR088 NB. errmsg: read failure
else.
    ok ,>dat
end.
)

getdocument=: 4 : 0

NB.*getdocument v-- get object documentation
NB.
NB. dyad: iaObject getdocument blcl

if. badrc uv=. (x,1) getobjects y do. uv else. ok <0 3 {"1 rv uv end.
)

getexplain=: 4 : 0

NB.*getexplain v-- gets short explanations.
NB.
NB. Note: Similar to (invfetch) and (getobjects) but different
NB. enough to justify new verb.
NB.
```

```
NB. dyad:  iaObject getexplain blcl
NB.
NB.  WORD getexplain ;:'you have some explaining to do'

if. badrc y=. checknames y do. y return. end.
obs=. y=. }.y
if. badrc tnl=. pathnl x do. tnl return. end.

NB. remove any empty dictionaries from path
tnl=. }. tnl
b=. 0&<@:#&> tnl
tnl=. b#tnl [ dpath=. b#DPATH

NB. if all objects are not on path get nothing
if. */b=. y e. ; tnl do.

DL=.  {:{:DPATH          NB. any object
fp=.  ({.>dncn__DL {.x), 'P__DL' NB. file pointer
res=. (#obs)$a:          NB. result list

NB. run down path
for_dp. tnl do.
  ix=. (dp=. >dp) i. y

NB. get data in current dictionary
if. +./bm=. ix<#dp do.
  DL =. {:dp_index{dpath NB. directory object !(*)=. DL
```

```
if. badjr dat=. jread (".fp");CNEXPLAIN do.
  jderr ERR088 return. NB. errmsg: read failure
end.
dat=. (bm#ix){>dat

NB. merge data into final result order matters here
res=. dat (obs i. bm#y)} res

NB. remove fetched objects from list quit if no more
if. 0=#y=. (-.bm)#y do. break. end.
end.
end.

NB. return objects in requested order
ok <obs ,. res

else.
  (jderr ERR083),y #~ -. b NB. errmsg: not on path
end.
)

getgstext=: 4 : 0

NB.*getgstext v-- get group and suite text.
NB.
NB. dyad: iaObject getgstext blcl
```

```
if. badrc uv=. (x,0) getobjects y do. uv else. ok <0 1 {"1 rv uv end.  
)
```

```
getntstamp=: 4 : 0
```

```
NB.*getntstamp v-- get name, creation and last put timestamps.
```

```
NB.
```

```
NB. dyad: iaDcode getntstamp blcl
```

```
NB.
```

```
NB. 1 getntstamp__ST__JODobj }. 1 revo ''
```

```
if. badrc uv=. (x,INCREASE,INPUT) invfetch y do. uv else. ok <(<y) ,: 1{uv end.  
)
```

```
getobjects=: 4 : 0
```

```
NB.*getobjects v-- fetches object names and values. A successful
```

```
NB. result is a boxed table. Column 0 holds names remaining
```

```
NB. columns hold types and values. If there is no type or name
```

```
NB. class only two columns are returned.
```

```
NB.
```

```
NB. dyad: il getobjects blcl
```

```
NB.
```

```
NB. NB. 2 columns (name,value)
```

```
NB. (TEST,0) getobjects ;:'some test names ehh'
```

```
NB.
```

```
NB. NB. 3 columns (name,class,value)
```


NB. (WORD,0) getobjects ;:'words are us'

```
if. badrc y=.checknames y do. y return. end.  
ord=. y=. }.y
```

```
'obj offset'=. x  
if. badrc onl=. pathnl obj do. onl return. end.
```

NB. remove any empty dictionaries from path

```
onl=. }. onl  
b=. 0&<@:#&> onl  
onl=. b#onl [ dpath =. b#DPATH  
val=. 0 0$''
```

NB. if all objects are not on path get nothing

```
if. */b=. y e. ; onl do.
```

```
doj=. {: {.dpath           NB. any directory object  
cnn=. (uv=. >dncn__doj obj), '__DL' NB. object component noun name  
fp=. ({.uv), 'P__DL'       NB. file pointer noun name
```

NB. run down the path fetching first occurrences

```
for_dp. onl do.  
  ix=. (dp=. >dp) i. y
```

NB. NIMP GETFACTOR not used yet

NB. get any objects in current dictionary

```

if. +./wf=. ix<#dp do.
  DL=. {:dp_index{dpath NB. directory object !(*)=. DL
  if. badjr dat=. jread (".fp);(wf#ix){offset+" .cnn do.
    jderr ERR088 return. NB. errmsg: read failure
  end.
  val=. val , >dat

  NB. remove fetched objects from list quit if no more objects
  if. 0=#y=. (-.wf)#y do. break. end.
end.
end.

NB. insure objects are returned in requested order
val=. (({"1 val) i. ord) { val
ok <val

else.
  (jderr ERR083),(-.b)#y NB. errmsg: not on path
end.
)

```

```
getrefs=: 4 : 0
```

*NB.*getrefs v-- fetches reference lists. A successful result is
 NB. an OK boxed table of boxed character lists. Column 0 holds
 NB. names and column 1 holds boxed reference lists. Currently
 NB. only words have stored references but this verb has been
 NB. coded to allow for additional reference types as the need*

```
NB. arises.
NB.
NB. dyad:  iaObject getrefs blcl
NB.
NB.  WORD getrefs ;:'get our references please'

if. badrc y=.checknames y do. y return. end.
y=. }.y

NB. if all objects are not on path get nothing
if. badrc onl=. pathnl x do. onl return. end.
if. 0 e. b=. y e. ; }.onl do.
  (jderr ERR083),(-.b)#y return.  NB. errmsg: not on path
end.

NB. reference table
rft =. i. 0 0

NB. objects with stored references
if. badrc onl=. pathref x do. onl return. end.

NB. remove dictionaries with no references from path
onl=. }. onl
b=. 0&<@:#&> onl
onl=. b#onl [ dpath =. b#DPATH

NB. if any stored references get them
```

```

if. #dpath do.

  NB. reference component noun name in directory object
  DL=. {: {. dpath
  cnn=. >0 dnrn__DL x

  NB. run down the path fetching the first occurrences
  for_dp. onl do.
    rix=. (dp=. >dp) i. y

    NB. NIMP GETFACTOR not used yet
    NB. if any references in current dictionary get them
    if. +./rf=. rix<#dp do.
      DL=. {:dp_index{dpath NB. directory object !(*)=. DL
      if. badjr dat=. jread UF__DL;(rf#rix){".cnn,'__DL' do.
        jderr ERR088 return. NB. errmsg: read failure
      end.
      rft=. rft , >dat

      NB. remove names with fetched references from list quit if no more
      if. 0=#y=. (-.rf)#y do. break. end.
    end.
  end.
end.

NB. any remaining objects currently have no stored references
if. #y do. ok <rft , (y ,"0 1 <x),.<'";'' else. ok <rft end.

```

)

gslistnl=: 4 : 0

*NB.*gslistnl v-- returns a group or suite name list. Prior to
NB. calling this verb a dictionary must be open and the (x)
NB. object code argument validated. The name list returned is the
NB. first one found on the current path.*

NB.

NB. dyad: iaObject gslistnl clName

NB.

NB. GROUP gslistnl 'groupname'

if. badrc path=. pathnl x do. path return. end.

uv=. (path=. }.path) fopix y

if. uv=#path do. (jderr ERR083),<y return. end. *NB. errmsg: not on path*

uv=. {:uv{DPATH *NB. directory object reference (*)=. uv*

cn=. (".(ln=. >dnix__uv x),'__uv') i. <y

cn=. cn { "(>dncn__uv x),'__uv' *NB. file component of list*

if. badjr cn=. jread ("({.ln),'P__uv');cn do.

jderr ERR084 *NB. errmsg: unable to read data*

else.

ok >{:>cn *NB. stored list is unique and sorted*

```
end.  
)
```

```
inputdict=: 4 : 0
```

```
NB.*inputdict v-- tests for objects in put dictionary
```

```
NB.
```

```
NB. dyad: (iaObject ;< ba) inputdict blcl
```

```
NB.
```

```
NB. (WORD;<DL) inputdict ;:'are we in put dictionary'
```

```
'obj DL'=. x NB. directory object !(*)=. DL
```

```
NB. errmsg: unable to load directory
```

```
if. loaddir__DL obj do. jderr ERR054
```

```
elseif. ix=. "(>dnix__DL obj),'__DL'
```

```
  */b=. y e. ix do. OK
```

```
elseif.do.
```

```
  (jderr ERR086),(-.b)#y NB. errmsg: not in put dictionary
```

```
end.
```

```
)
```

```
invappend=: 4 : 0
```

```
NB.*invappend v-- appends items to inverted data lists. The (x)
```

```
NB. argument is a boxed list append list. (y) is a boxed list
```

```
NB. containing a file pointer and inverted component numbers.
```

```
NB.
NB. dyad: blul invappend blul
NB.
NB.  apps invappend WF_DL ; CNCLASS,CNPUTDATE,CNSIZE

msg=. ERR057  NB. errmsg: directory update failure

NB. file pointer & component list
'fp cml'=. y
if. (#x)~:#cml do. jderr msg return. end.
rc=. i.0

NB. get the total number of expected elements from 0 component
if. badjr dat=. jread fp;CNMARK do. jderr msg return. end.
oldlen=. >{.>dat

NB. loop for maximum safety and space savings
for_cn. cml do.

  if. badjr dat=. jread fp;cn do. jderr msg return. end.
  dat=. >dat

NB. all inverted list lengths must match expected
if. oldlen ~: #dat do. jderr msg return. end.

dat=. dat , >cn_index{x
rc=. rc, (<dat) jreplace fp ; cn
```

```
end.
```

```
NB. test replacements for errors
```

```
if. badreps rc do. jderr msg else. OK end.
```

```
)
```

```
invdelete=: 4 : 0
```

```
NB.*invdelete v-- deletes items from inverted data lists. The
```

```
NB. (x) argument is a mask list. (y) consists of a boxed list
```

```
NB. containing a file pointer and inverted component numbers.
```

```
NB.
```

```
NB. dyad: pl invdelete blul
```

```
NB.
```

```
NB. mask invdelete WF_DL ; CNCLASS,CNPUTDATE,CNCREATION,CNSIZE
```

```
NB. file pointer & component list
```

```
'fp cmpl'=. y
```

```
msg=. ERR057 NB. errmsg: directory update failure
```

```
rc=. i.0 [ len=. #x
```

```
NB. get the total number of expected elements from 0 component
```

```
if. badjr dat=. jread fp;CNMARK do. jderr msg return. end.
```

```
oldlen=. >{.>dat
```

```
NB. loop for maximum safety and space savings
```

```
for_cn. cmpl do.
```



```
if. badjr dat=. jread fp;cn do. jderr msg return. end.
dat=. >dat

NB. all inverted list lengths must match expected
if. oldlen ~: #dat do. jderr msg return. end.

rc=. rc, (<x#dat) jreplace fp;cn
end.

NB. test replacements for errors
if. badreps rc do. jderr msg else. OK end.
)

invfetch=: 4 : 0

NB.*invfetch v-- reads inverted numerical data lists from
NB. dictionary files. Assumes the (x) argument has been
NB. validated prior to calling.
NB.
NB. dyad: ilDcodes invfetch blcl
NB.
NB. NB. first code is JOD object code
NB. 0 12 13 14 15 invfetch__ST__JODobj }. dnl''
NB. 2 13 14 invfetch__ST__JODobj }. 2 dnl''
NB. (SUITE_ajod_,INCREASE_ajod_,INPUT_ajod_) invfetch__ST__JODobj }. SUITE_ajod_ dnl''

if. badrc y=. checknames y do. y return. end.
obs=. y=. }.y
```

```

if. badrc tnl=. pathnl {.x do. tnl return. end.

NB. remove any empty dictionaries from path
tnl=. }. tnl
b=. 0<&@:#&> tnl
tnl=. b#tnl [ dpath=. b#DPATH

NB. if all objects are not on path get nothing
if. */b=. y e. ; tnl do.

  NB. map external codes to inverted data components
  cninv=. ((0{INCNXR) i. }.x) { 1{INCNXR  NB. object noun !(*)=. INCNXR
  DL=.    {:{:DPATH  NB. any object
  fp=.    {>.dncn__DL {.x), 'P__DL'  NB. file pointer
  res=.    ((#cninv),#obs)$0  NB. result table

  NB. run down path
  for_dp. tnl do.
    ix=. (dp=. >dp) i. y

    NB. get data in current dictionary
    if. +./bm=. ix<#dp do.
      DL =. {:dp_index{dpath  NB. directory object !(*)=. DL
      if. badjr dat=. jread ("fp);cninv do.
        jderr ERR088 return. NB. errmsg: read failure
      end.
      dat=. (bm#ix) {"1 > dat

```

```

    NB. merge data into final result order matters here
    res=. dat (<a.;obs i. bm#y)} res

    NB. remove fetched objects from list quit if no more
    if. 0=#y=. (-.bm)#y do. break. end.
end.
end.

NB. returns a list when only one item otherwise table
ok < ]`,@.(1&=@:#) res

else.
    (jderr ERR083),y #~ -. b NB. errmsg: not on path
end.
)

invreplace=: 4 : 0

NB.*invreplace v-- replaces items from inverted data lists. The
NB. (x) argument is a boxed list of positions and replacements.
NB. (y) is a boxed list containing a file pointer and inverted
NB. component numbers.
NB.
NB. dyad: blul invreplace blul
NB.
NB. (pos;reps) invreplace WF__DL ; CNCLASS,CNPUTDATE,CNSIZE
```

```
msg=. ERR057  NB. errmsg: directory update failure

NB. file pointer & component list
'fp cml'=.  y
'pos repl'=. x
if. (#repl)~:#cml do. jderr msg return. end.
rc=. i.0

NB. replacements do not change the length of inverted lists
NB. get the total number of elements from 0 component
if. badjr dat=. jread fp;CNMARK do. jderr msg return. end.
len=. >{.>dat

NB. loop for maximum safety and space savings
for_cn. cml do.

  if. badjr dat=. jread fp;cn do. jderr msg return. end.
  dat=. >dat

  NB. all inverted list lengths must match
  if. len ~: #dat do. jderr msg return. end.

  dat=. (>cn_index{repl} pos} dat
  rc=. rc, (<dat) jreplace fp ; cn
end.

NB. test replacements for errors
```

```
if. badreps rc do. jderr msg else. OK end.  
)
```

NB. 1 if dictionary is a library

```
islib=: '*'"_ = [: {. [: > {.
```

```
iswriteable=: 3 : 0
```

*NB.*iswriteable v-- tests a blcl of full path file names for
NB. writeablity.*

NB.

*NB. This verb takes a list of full path file names and tests the
NB. read/write status of the files. The result is boolean list*

NB. with 1 denoting "writeable" and 0 denoting "not-writeable."

NB.

NB. monad: pl =. iswriteable blclPathFile

```
if. IFWIN do. iswriteablewin y else. iswriteablelinux y end.  
)
```

```
iswriteablelinux=: 3 : 0
```

*NB.*iswriteablelinux v-- tests a blcl of full path linux files
NB. for writeablity.*

NB.

NB. monad: pl =. iswriteablelinux blclPathFile

NB. NIMP: check linux file read/write/access status

NB. NIMP: returns all 1's for now

```
(#,y)#1  
)
```

NB. tests permissions/attributes of a blcl of full path file names for writeability

iswriteablewin=: 'w-'_" -:"1 [:] 1 3"_ {"1 [: ;"1 [:] _2: {."1 [: > [: ,&(1!:0)&.>]

jdatcreate=: 4 : 0

*NB.*jdatcreate v-- creates an empty dictionary data file. (y) is*

NB. a path and (x) is a file name

NB.

NB. dyad: clFile jdatcreate clPath

NB.

NB. 'jtests' jdatcreate 'c:\temp\jdict2a\'

NB. 'jgroups' jdatcreate 'c:\blanks are cool\jdict 2a\'

fn=. (alltrim y) , x -. ' '

msg=. ERR052 NB. errmsg: unable to initialize

```
if.      -.jcreate fn do. (jderr msg),<fn
```

```
elseif. c=. < 0 ; t=. now ''          NB. length and directory stamp
```

```
    c=. c , <' '          NB. c1 RESERVED
```

```
    badappend c=. (c , (OFFSET-#c) # a:) jappend fn do. (jderr msg),<fn
```

```
elseif. do.
```

```
    ok {: c NB. return last component
```

```
end.
```

```
)
```

```
jwordscreeate=: 4 : 0
```

```
NB.*jwordscreeate v-- creates an empty word file. (y) argument is  
NB. a fully qualified file name. (x) is a boxed list of  
NB. dictionary creation parameters. The target directory is  
NB. assumed to exist. Result is a return code and message.
```

```
NB.
```

```
NB. dyad:  blParms jwordscreeate clFile
```

```
NB.
```

```
NB. (doc;parms) jwordscreeate 'c:\temp\jdict2a\jwords' NB. no extension
```

```
msg=. ERR052 NB. errmsg: unable to initialize
```

```
if.      -.jcreate y do. (jderr msg),<y
```

```
elseif. c=. < 0 ; t=. now ''      NB. c0 length and directory stamp
```

```
    c=. c , <' '      NB. c1 RESERVED
```

```
    c=. c , 0{x      NB. c2 this dictionary's documentation
```

```
    c=. c , <}. x      NB. c3 dictionary parameters
```

```
    badappend c=. (c , (OFFSET-#c) # a:) jappend y do. (jderr msg),<y
```

```
elseif. do.
```

```
    ok {: c NB. return last component
```

```
end.
```

```
)
```

```
loadalldirs=: 4 : 0
```

```
NB.*loadalldirs v-- loads all (x) directories for each open (y)
NB. dictionary.
NB.
NB. dyad: iaObject loadalldirs blcl
NB.
NB. WORD loadalldirs {"1 DPATH

x=. |x
for_oj. y do.
  if. loaddir__oj x do.
    jderr ERR054 return. NB. errmsg: unable to load directory
  end.
end.
OK
)

loadallrefs=: 4 : 0

NB.*loadallrefs v-- loads all references for (y) dictionary.
NB.
NB. dyad: iaObject loadallrefs blcl
NB.
NB. WORD loadallrefs {"1 DPATH

for_oj. y do.
  if. loadref__oj x do.
    jderr ERR079 return. NB. errmsg: unable to load references
```



```
    end.
end.
OK
)

loadwords=: 4 : 0

NB.*loadwords v-- loads dictionary words into target locales.

DL=. {: y  NB. obfuscate (/:)=: directory object !(*)=. DL

NB. NIMP GETFACTOR not used yet
NB. read words and determine name class
if. badjr wu=. jread WF__DL;x{WORDCN__DL do.
    jderr ERR088  NB. errmsg: read failure
else.
    bu=.    0 ~: ; 1&{&> wu
    loc=. >{: y  NB. target locale

    NB. define words that are not nouns
    NB. NIMP may be able to speed things up by switching
    NB. to target locale in top of script and then switching
    NB. back to current - eliminates need to hard wire target locale
    NB. to each word.

    try.
        if. #vu=. bu#wu do.
            0!:0  ; (({:&> vu) ,&.> <loc, '=:') ,&.> ({:&> vu) ,&.> <LF
```

```

end.

NB. define nouns - override mixed assignments (<:)=:
if. #nu=. (-.bu)#wu do.
    vu=. ({.&> nu) ,&.> <loc
    (vu)=: (3!:2)&.> {:&> nu
end.
catch. jderr ERR091 return. end.
OK
end.
)

mainddir=: 3 : 0

NB.*mainddir v-- creates the main dictionary directory from a
NB. path.
NB.
NB. monad: mainddir clPath
NB.
NB. mainddir 'c:\go\ahead\create\my\directory'

NB.#ASSERT 0 < #y.
y=. (-PATHDEL=: y) }. y , PATHDEL
drv=. alltrim (,&':'`]&.(0&=@: #)) justdrv y

NB. standard path format
sp=. alltrim justpath y
y=. drv,sp,PATHDEL

```

*NB. path must begin with (PATHDEL) to force user to
NB. think carefully about where dictionary is placed*

```
if. PATHDEL~:{. sp, ' ' do.  
  jderr ERR059 NB. errmsg: full rooted path required  
  return.  
end.
```

NB. subpath list with any drive attached

```
sp=. ;&.> <"1 ,/\ <;.1 sp  
sp=. (<drv) ,&.> sp
```

NB. attempt to create last directory on path

```
if. 1=makedir {: sp do. ok y
```

NB. upon failure run down paths attempting to create all

NB. intermediate directories - many operations will

NB. typically fail because some intermediates will exist

```
elseif. makedir"0 }: sp  
  1=makedir {: sp do. ok y  
elseif. do.  
  (jderr ERR060),<y NB. errmsg: unable to create directory  
end.  
)
```

```
mnlsearch=: 4 : 0
```

*NB.*mnlsearch v-- master name list search.*

NB.

NB. dyad: ilOpt mnlsearch clNamePattern

NB. ERR006 cannot read master

```
if. badjr d=. >jread (JMASTER,IJF);CNMFTAB do. jderr ERR006 return. end.
```

NB. ERR104 no registered dictionaries

```
if. 0 e. $d do. jderr ERR104 return. end.
```

```
if. fex f=. (tslash2&.> 2{d) ,&.> <(;(0{x){JDFILES),IJF do.
```

```
  r=. 0 2$<' ' [ y=. ,y
```

```
  g=. (<: |1{x){nlpfx`nlctn`nlsfx
```

NB. read class if not default and WORD or MACRO

```
b=. ((0{x) e. WORD,MACRO) *. DEFAULT ~: 2{x
```

```
for_i. i.#f do.
```

```
  o=. i{f [ n=. i{0{d
```

NB. ERR088 jfile read failure

```
if. badjr p=. >jread o;CNLIST do. jderr ERR088 return. end.
```

```
if. b do.
```

```
  if. badjr s=. >jread o;CNCLASS do. jderr ERR088 return. end.
```

```
  p=. p #~ s = 2{x
```

```
end.
```

```
if. 0=#p do. continue. end.
```

```
r=. r , (p (g `: 6) y) ,. n
```

```
end.  
r=. /:~ r  
if. 0 > 1{x do. ok <dupnames r else. ok <r end.  
else.  
b=. (1:@(1!:4) ::0:) f  
(jderr ERR073) , f #~ -. b  
end.  
)
```

```
newdparms=: 3 : 0
```

```
NB.*newdparms v-- sets the dictionary parameters for a new  
NB. dictionary.
```

```
NB.
```

```
NB. monad: newdparms bluu
```

```
NB.
```

```
NB. newdparms sd;dp;dname;dn;path
```

```
NB. subdirectories, parameters, name, unique number and path
```

```
'sd dp name dn path'=. y
```

```
NB. name, number, creation, last dump, [paths], J version, J system
```

```
uv=. name ; dn ; (now '') ; (6#0) ; (<path) ,&.> sd ,&.> PATHDEL
```

```
uv=. uv , (9!:14'');9!:12 ''
```

```
NB. dictionary number path context - empty until references created
```

```
uv=. uv , <i.0
```

```
NB. reduce user parameter table to names and values
uv , < |: 0 2 {"1 dp
)

newregdict=: 4 : 0

NB.*newregdict v-- creates a new dictionary or registers an extant
NB. dictionary.
NB.
NB. dyad: iaOptions newregdict (clDictionary ; clPathroot)
NB.
NB. NB. register extant dictionary
NB. 0 newregdict 'dictionary name';'c:\where\it\lives' NB. drive required
NB.
NB. NB. create new dictionary
NB. 1 newregdict 'new name';'c:\new\location'

mf=. JMASTER NB. master file
msg=. ERROR61 NB. errmsg: invalid dictionary name;path[;documentation]

if. (badbu y) +. 1~:#$ y do. jderr msg
elseif. (3<#y) +. 2>#y do. jderr msg
elseif. +./badcl&> y do. jderr msg
elseif.do.

NB. names and paths cannot be empty - sorry
'name path doc'=. 3{.y,<' '
name=. alltrim name [ path=. hostsep alltrim path
```

```

if. 0&e. (#name),#path do. jderr msg return. end.

NB. restrict dictionary name and path characters
if. 0&e. name e. ' ',ALPHA do.
  jderr ERR062 return. NB. errmsg: invalid characters in name
elseif. 0&e. path e. PATHCHRS,ALPHA do.
  jderr ERR063 return. NB. errmsg: invalid characters in path
end.

if. IFWIN do.
  NB. check for UNC paths
  if. (2#PATHDEL) -: 2{.path do.
    NB. insure UNC paths are terminated
    path=. path,(PATHDEL={:path}).PATHDEL

    NB. NIMP: NOTE: (freedisk)'ing windows network drives (more
    NB. than once) is time consuming and typically unnecessary!
    NB. These volumes are often huge and JOD empty dictionaries
    NB. are tiny - hence we ASSUME sufficient space. The following
    NB. commented code tests UNC volumes.

    disk=.' ' NB. empty disk suppresses space testing

    NB. test if the maximum size of subpaths exceeds threshold
    NB. depends on (freedisk) returning zero for invalid paths
    NB. omit root \ and last nonexistent path
    NB. if. 0=#uv=. _1 }. 2 }.;&.> <"1 ,/\ <;.2 path do.

```

```
    NB. (jderr ERR065),<path return. NB. errmsg: not enough space on drive
    NB. end.
    NB. if. (>./freedisk& uv) < FREESPACE do. (jderr ERR065),<path return. end.
else.
    NB. check for windows drive letter (required) and
    NB. determine if there is enough space on the target drive
    NB. errmsg: target drive is required
    if. isempty tdrv=. justdrv path do. jderr ERR064 return. end.

    NB. windows drive letters
    disk=. tdrv,': ',PATHDEL
end.
else.
    NB. require rooted linux paths
    if. PATHDEL ~: {.path do. (jderr ERR096),<path return. end.

    NB. NIMP: how does one determine the volume name for a given
    NB. fully qualified linux file that resides on said volume?
    disk=. path
end.

if. (x=1) *. 0<#disk do. NB. HARDCODE (x) option
    bytes=. freedisk disk
    NB. errmsg: not enough space
    if. bytes < FREESPACE do. (jderr ERR065),<disk return. end.
end.
```



```
NB. attempt to read master
if. badjr uv=. jread mf;CNMFTAB,CNMFPARMS,CNMFLOG do.
  jderr ERR006 return. NB. errmsg: cannot read master
end.

NB. mark master - this verb updates if successful
NB. all error calls should use (jdmasterr) until
NB. the master is cleared at the end of this verb
if. badrc msg=. markmast 1 do. msg return. end.

NB. master table, dictionary parameters, number log
'mdt dpt dlg'=. uv
NB. errmsg: dictionary name in use
if. (<name) e. 0{mdt do. jdmasterr ERR066 return. end.

if. x=1 do.
  NB. attempt to create main root directory
  if. badrc path=. mainddir path do. path [ markmast~0 return. end.

  NB. attempt to create standard subdirectories
  path=. {: path
  if. 0&e. uv=. mkdir"0 path ,&.> JDSDIRS do.
    jdmasterr ERR067 return. NB. errmsg: unable to create subdirectories
  end.
  path=. > path

  dn=. didnum 0   NB. unique dictionary number
```

```

uv=. newparms JSDIRS;dpt;name;dn;path

NB. create empty dictionary files
uv=. <(doc;uv) jwordscree path,>0{JDFILES
uv=. uv , (}.JDFILES) jdatcreate&.> <path
if. 0&e. ;{.&> uv do.
    jdmasterr ERR068 return. NB. errmsg: unable to setup dictionary file(s)
end.
newmdt=. mdt,.name;dn;path;0
okm=.OK050
else.
    path=. (-PATHDEL={:path) }. path,PATHDEL

NB. test existence of dictionary files
fn=. JDFILES ,&.> <IJF
if. 1 e. uv=. -. fex"1 dcfiles=. <@:;"1 (<path) ,"0 / fn do.
    (jdmasterr ERR073),<name return. NB. errmsg: missing dictionary file(s)
end.

NB. NIMP should run under a trap here to protect
NB. against files that appear to be dictionary but are not

NB. read dictionary parameter table and documentation
if. badjr dat=. jread (file=. path,>{.JDFILES);CNPARDS,CNDICDOC do.
    jdmasterr ERR088 return. NB. errmsg: jfile read failure
end.

```

```
NB. dictionary parameters and unique id
'dpt olddoc'=. dat
dn=. 1 {:: dpt

NB. didnum's must be unique
NB. errmsg: duplicate dictionary id number
if. dn e. ; 1{mdt do. jdmasterr ERR092 return. end.

NB. if not a library adjust dictionary paths, name and documentation
if. -.islib dpt do.

    NB. test dictionary file attributes - we must be able to read/write
    if. 0 e. iswriteable dcfiles do.
        NB. errmsg: dictionary file attributes do not allow read/write
        jdmasterr ERR095 return.
    end.

    dpt=. ((<path) ,&.> JDSDIRS ,&.> PATHDEL) PARMDIRS} dpt
    dpt=. (<name) 0} dpt
    doc=. (*#doc){olddoc;doc
    if. badreps (dpt;doc) jreplace file;CNPARMS,CNDICDOC do.
        jdmasterr ERR056 NB. errmsg: jfile replace failure
    end.
end.

newmdt=. mdt,.name;dn;path;0
okm=. OK058
```

```
end.
```

```
NB. update master dictionary table+backup, didnum log, open status
```

```
uv=. (newmdt;mdt;dlg,dn) jreplace mf;CNMFTAB,CNMFTABBCK,CNMFDLOG
```

```
if. 0&> <./uv do. jdmasterr ERR069 return. end. NB. errmsg: error updating master
```

```
NB. free master file for other tasks
```

```
if. badrc msg=. markmast~0 do. msg return. end.
```

```
ok okm;name;jpathsep path
```

```
end.
```

```
)
```

```
NB. names containing substring: (;:'cats bats') nlctn 'at'
```

```
nlctn=: ([: I. [: +./"1 ([: ,: ]) E. [: > [) { [
```

```
NB. match prefixes (optimize for large lists): (;:'he bo boat') nlpfx 'bo'
```

```
nlpfx=: [ #~ ([: < [: , ]) -:&> ([: # [: , ]) {.&.> [
```

```
NB. match name suffixes: (;:'yada yada yo') nlsfx 'da'
```

```
nlsfx=: [ #~ ([: < [: , ]) -:&> ([: - [: # [: , ]) {.&.> [
```

```
NB. containing pattern in raised and nubbed
```

```
nubnlctn=: ([: sortdnub [) nlctn ]
```

```
NB. match prefixes in raised and nubbed
```

```
nubnlpfx=: ([: sortdnub [) nlpfx ]
```

```
NB. match suffixes in raised and nubbed
nubnlsfx=: ([: sortdnub []] nlsfx ]

opendict=: 4 : 0

NB.*opendict v-- opens dictionaries. Dictionary names and master
NB. table have been validated prior to calling this verb. The
NB. dictionary system does not leave files open as this
NB. significantly decreases crash resistance. Instead the master
NB. dictionary table is marked with 1 when dictionaries are opened
NB. read/write. Only one task can open a dictionary read/write.
NB. Many tasks can open the same dictionary read/only.
NB.
NB. dyad: blclDictionary opendict (iaOption ; btMdt)
NB.
NB. ('d0';'d1') opendict 1;jread JMASTER;CNMFTAB NB. open di r/w

NB. quit if open limit exceeded - limits the number of directory objects
NB. errmsg: request exceeds open limit
if. DPLIMIT<(#x)+#DPATH do. jderr ERR070 return. end.

NB. if any dictionary is already on the path quit with error
uv=. x e. {."1 DPATH
if. 1 e. uv do. (jderr ERR071),uv#x return. end. NB. errmsg: already open

NB. open status and master dictionary table
'os mdt'=. y
```

```
NB. get locations of dictionaries to open
pd=. (0{mdt) i. x
ld=. (<2;pd){mdt

NB. if any dictionary is already open read/write quit with error
NB. note: because other tasks may have a dictionary open read/write
NB. it does not appear on the path of this task - HARDCODE: rs code
rs=. 0 < ; (<3;pd){mdt
NB. errmsg: another task opened read/write
if. 1 e. rs do. (jderr ERR072),(1=rs)#x return. end.

NB. standard files with extension
fn=. JDFILES ,&.> <IJF

NB. test existence of alleged dictionary files
if. 1 e. uv=. -. fex"1 dcfiles=. <@:;"1 ld ,"0 / fn do.
  (jderr ERR073),uv#x return. NB. errmsg: missing dictionary file(s)
end.

NB. open request seems valid - mark master
if. badrc msg=. markmast 1 do. msg return. end.

dpath=. DPATH
libstatus=. i.0

for_dp. ld do. NB. depends on (#x)=(#pd)=#ld
```

```

NB. get dictionary parameters
if. badjr pdp=. jread (;dp,{.fn);CNPARMS do.
  NB. errmsg: cannot read dictionary parameters
  (jdmasterr ERR074),dp_index{x return.
end.

NB. master table didnum must match current dictionary didnum
if. ((<1;dp_index{pd){mdt) -: 1{>pdp do.

  NB. is the master path a prefix of stored dictionary paths?
  NB. assumes: all subdir path prefixes are the same - this
  NB. is true for dictionaries created by (newd)
  nppfx=. -.0{(;dp) E. ;(0{PARMDIRS){>pdp

  if. nppfx *. islib >pdp do.
    NB. remap paths for libraries if necessary - allows LAN file sharing
    NB. of libraries for many users/tasks with different access paths
    NB. WARNING: if these directories are on locked down LAN volumes
    NB. JOD commands like: make'' may return cannot write errors
    pdp=. >pdp
    npth=. PATHDEL ,&.>~ dp ,&.> PATHDEL&afterlaststr&.> rpdtrim&.> PARMDIRS{pdp
    pdp=. <npth PARMDIRS}pdp
  else.
    NB. master/stored dictionary paths must match for read/write
    if. nppfx do.
      if. #dpath=. ({:"1 dpath) -. {:"1 DPATH do. coerase"0 dpath end.
      NB. errmsg: master/dictionary file path mismatch - have owner set READONLY name/DIDNUM ->

```

```

        (jdmasterr ERR098),0 1{>pdp return.
    end.

    NB. for read/write dictionaries (not-libraries) insure
    NB. the dictionary file permissions/attributes allow writing
    if. 0 e. iswriteable dp_index{dcfiles do.
        if. #dpath=. ({:"1 dpath) -. {:"1 DPATH do. coerase"0 dpath end.
            NB. errmsg: dictionary file attributes do not allow read/write ->
            (jdmasterr ERR095),dp_index{x return.
        end.
    end.

    NB. create new directory object
    DL=. conew 'ajoddob'
    name=. dp_index{x
    if. createdl__DL nppfx;name;dp;os;pdp do.
        NB. append to path copy
        dpath=. dpath , (a: ,~ name , 1{>pdp),DL
        NB. are we a read only library?
        libstatus=. libstatus,LIBSTATUS__DL
    else.
        if. #dpath=. ({:"1 dpath) -. {:"1 DPATH do. coerase"0 dpath end.
            (jdmasterr ERR075),dp_index{x NB. errmsg: unable to open directory
            return.
        end.
    else.

```

```

    NB. destroy any directory objects opened before inconsistency
    if. #dpath=. ({:"1 dpath) -. {"1 DPATH do. coerase"0 dpath end.
    (jdmasterr ERR076),dp_index{x    NB. errmsg: master-dictionary inconsistency
    return.

end.
end.

NB. update master read/write status and release
NB. read/write dictionaries are marked with unique
NB. id and read/only dictionaries are marked with 0
DPATH=: dpath
NB. do not mark any library (read/only) dictionaries open
pd=. (-.libstatus)#pd
mdt=. (<JODOBID * 1=os) (<3;pd)} mdt    NB. object noun !(*)=. JODOBID
if. badreps (<mdt) jreplace JMASTER;CNMFTAB do.
    jdmasterr ERR077 NB. errmsg: unable to update master
elseif. badrc msg=. markmast~0 do. msg NB. HARDCODE: r/w codes
elseif. os e. 1 2 do.
    uv=. (1=os){rs=. '/' ,&.> READSTATS    NB. read/only and read/write strings
    (ok OK052,({. ;libstatus{(uv,0{rs)),') ->'),x
elseif.do. jderr ERR001
end.
)

pathnl=: 3 : 0

```

*NB.*pathnl v-- returns a complete path order list of objects (y).*

NB.

NB. monad: pathnl iaObject

NB.

NB. pathnl WORD NB. all words on current path

```
pob=. {"1 DPATH
```

```
if. badrc uv=. y loadalldirs pob do. uv return. end.
```

```
ok (>dnix_uv y) fullmonty pob [ uv=. {.pob
```

```
)
```

```
pathref=: 3 : 0
```

*NB.*pathref v-- returns a complete path order list of objects*

NB. with reference lists. Currently only words have stored

NB. references but more may be added as the need arises.

NB.

NB. monad: pathref iaObject

NB.

NB. pathref WORD NB. all words on current path with stored references

```
pob=. {"1 DPATH
```

```
if. badrc uv=. y loadallrefs pob do. uv return. end.
```

```
ok (>dnrn_uv y) fullmonty pob [ uv=. {.pob
```

```
)
```

```
putdicdoc=: 3 : 0
```

```
NB.*putdicdoc v-- writes put dictionary documentation.
NB.
NB. monad:  putdicdoc clDoc

NB. assumes a put dictionary is open
if. badcl y do. jderr ERR097 NB. errmsg: invalid dictionary document must be character list
else.
  DL=. {:{.DPATH NB. directory object !(*)=. DL

  NB. Whether the put dictionary document is stored depends on the
  NB. value of the "new" dictionary parameter DOCUMENTDICT.
  dictdoc=. 1
  if. 0=nc<'DOCUMENTDICT' do. dictdoc=. 1=DOCUMENTDICT
  elseif.
    NB. if setting exists in put dictionary directory use it
    0=nc<'DOCUMENTDICT__DL' do. dictdoc=. 1=DOCUMENTDICT__DL
  end.

  NB. remind user DOCUMENTDICT is off
  if. -.dictdoc do. ok OK063;DNAME__DL return. end.

  if. badreps (<y) jreplace WP__DL;CNDICDOC do. jderr ERR056 NB. errmsg: replace failure
  else.
    ok OK062;DNAME__DL
  end.
end.

end.
```

```
)

putexplain=: 4 : 0

NB. *putexplain v-- stores short object explanation text.
NB.
NB. dyad: (iaObject ;< ba) putexplain bt/blcl

NB. validate explain texts
if. badrc y=. checknttab y do. y return. else. y=. rv y end.
if. +/.MAXEXPLAIN < #&> {:"1 y do. jderr ERR089 return. end. NB. errmsg: text(s) to long

'obj DL'=. x NB. directory object !(*)=. DL

if. badrc uv=. x inputdict {."1 y do. uv
else.

ix=. (>dnix__DL obj),'__DL' NB. directory object noun name
fp=. "({.>dncn__DL obj),'P__DL' NB. file pointer

pos=. ("ix) i. {."1 y NB. inverted list replacement positions

NB. objects exist in put dictionary update explain text
if. badrc uv=. (pos;<<{:"1 y) invreplace fp;CNEXPLAIN do. uv return. end.

uv=. ' ',>dnm__DL obj
ok ((":#pos),uv,OK055) ; DNAME__DL
```

```
end.
```

```
)
```

```
putgs=: 4 : 0
```

```
NB.*putgs v-- stores dictionary groups and suites. Prior to  
NB. calling this verb names, path and put dictionary status have  
NB. been validated.
```

```
NB.
```

```
NB. dyad: (bacl ; ia ; ia) putgs blcl
```

```
NB.
```

```
NB. ((('<'6');WORD;GROUP) putgs ;: 'group and members'
```

```
'DL code gtype'=. x NB. directory object !(*)=. DL
```

```
if. badrc msg=. pathnl code do. msg return. end.
```

```
y=. /:~ ~. }. y [ gn=. {. y
```

```
if. */b=. y e. ; }. msg do.
```

```
NB. change/create group -- insure group directory is ready
```

```
if. loaddir__DL gtype do.
```

```
  jderr ERR054 NB. errmsg: unable to load directory
```

```
elseif. do.
```

```
NB. depends on first char of index list matching (cP_DL) nouns
```

```
fc=. {. ix=. (>dnix__DL gtype),'__DL'
```

```
cn=. (>dncn__DL gtype),'__DL'
```

```
NB. groups/suites are either new or replacements
uv=. ("ix) i. gn
dfopen__DL fc
gp=. ".fc, 'P__DL'

if. uv="#".ix do.

  NB. group is new - create

  NB. EDGE CONDITION?? if another group with the same
  NB. name exists on the path copy the group/suite text
  NB. of that group to this new group. Use of this system has shown
  NB. that this is desirable behaviour because of the common
  NB. practice of "regrouping" in the put dictionary new versions
  NB. of the same group that are deeper on the path.
  if. +./uv=. (<gn) e.&> }. pathnl gtype do.
    if. badrc uv2=. gtype getgtext gn do. uv2 return. else. uv=. (1;0 1){::uv2 end.
  else.
    uv=. '' NB. default script is empty
  end.

  gdat=. <gn , uv ; < y      NB. (cn) name, script, contents
  gdat=. gdat , <gn , 3$<' ' NB. (cn+1) name, latex, html, text, et cetera

  NB. append group
  if. badappend apcn =. gdat jappend gp do.
    jderr ERR058 [ dfclose__DL fc return. NB. errmsg: append failure
```

```
end.

stamp=. nowfd now ''
uv=. stamp;stamp;<a:
uv2=. CNPUTDATE,CNCREATION,CNEXPLAIN NB. NIMP group append
if. badrc msg=.uv invappend gp;uv2 do. msg
else.
  NB. update directory
  uv=. ("ix) , gn
  uv2=. (.cn) , { .apcn
  if. badrc (gtype,gp) savedir__DL uv;uv2 do.
    jderr msg [ dfclose__DL fc return.
  else.

    NB. stamp good directory change
    (<("#.ix);now '') jreplace gp;CNMARK
  end.
end.

else.

  NB. group exists - update
  apcn=. uv { ".cn
  if. badjr uv2=. jread gp;apcn do.
    jderr ERR088 [ dfclose__DL fc return. NB. errmsg: read failure
  elseif. gn -: 0 {>uv2 do.
```

```

    NB. update group list - group script is not changed
    if. badreps (<{>:uv2),<y) jreplace gp;apcn do.
        jderr ERR056 [ dfclose__DL fc return. NB. errmsg: replace failure
    end.

    uv2=. uv;nowfd now ''
    if. badrc msg=.uv2 invreplace gp;CNPUTDATE do. msg return. end.

elseif.do.
    jderr ERR055 return. NB. errmsg: directory-data inconsistency
end.
end.

dfclose__DL fc
uv=. ,>dnm__DL gtype
ok(uv,' <','(>gn),'> ','OK059);DNAME__DL
end.

else.
    (jderr ERR083),y #~ -. b NB. errmsg: not on path
end.
)

putntstamp=: 4 : 0

NB.*putntstamp v-- store name, creation and last put timestamps.
NB.
NB. dyad: (iaObject ;< ba) putntstamp btNts

```



```

NB.
NB.   'rc nts'=: 0 _14 get }. revo ''
NB.   DL=: {:{:DPATH__ST__JODobj
NB.   (WORD;<DL) putntstamp__ST__JODobj nts

NB. validate name/creation/lastput array
if. badrc uv=. checkntstamp y do. uv return. else. uv=. rv uv end.

NB. directory object !(*)=. DL
'obj DL'=. x

NB. timestamp names must exist on current path:  errmsg: not on path ->
tn=. ;0{uv [ pn=. ; }. pathnl obj
if. 0 e. bm=. tn e. pn do. (jderr ERR083),(-.bm)#tn return. end.

NB. get current timestamps and object index
if. badrc cts=. gettstamps__DL obj do. cts return. else. cts=. rv cts end.
oix=. "(>dnix__DL obj),'__DL'

pos=. oix i. tn      NB. timestamp name positions in index
pix=. pos -. #oix    NB. put dictionary name positions
npx=. (I. pos = #oix){tn NB. names that are not in put dictionary
ppn=. pix{oix        NB. names that are in put dictionary

NB. update put dictionary timestamps - insure shape is unchanged
scts=. $cts
cts=. ((tn i. ppn) {"1 ;1{uv) pix}"1 cts

```

```
if. -.scts -: $cts do. jderr ERR102 return. end.
```

NB. attempt to save changes

```
if. badrc uv=. obj puttstamps__DL cts do. uv
```

```
else.
```

```
  ok ('(',(":#ppn),OK064,(":#npn),OK065);(<ppn),<npn
```

```
end.
```

```
)
```

```
puttable=: 4 : 0
```

*NB.*puttable v-- stores (name,text) and (name,type,value) tables.*

NB. Used to store tests, macros, and word tables. Result is a

NB. return code and message. Note: the directory object reference

NB. (DL) has been set before calling this verb.

NB.

NB. dyad: (iaObj ; bacl) puttexts btNameScript/btNameTypeValue

NB.

NB. (TEST;<DL) puttable ('name1';'name2') ,. 'script...';'script...'

```
'code DL' =. x NB. directory object !(*)=. DL
```

```
if. loaddir__DL code do.
```

```
  jderr ERR054 NB. errmsg: unable to load directory
```

```
else.
```

```
  y=. >{:y
```

NB. depends on first char of index list matching (cP_DL) nouns

```
fc=. {. ixn =. (>dnix__DL code), '__DL'
cnn=. (>dncn__DL code), '__DL'

NB. either new or replacements
uv=. ("ixn) i. {"1 y
b=. uv = #"ixn
pc=. 0

NB. replace (will not change key directory lists)
dfopen__DL fc
fp=. ".fc, 'P__DL'

if. 0 e. b do.
  if. badrc msg=. (code;ixn;cnn;fp;<DL) rplctable (<(-.b)#y),<(-.b)#uv do.
    msg [ dfclose__DL fc return.
  end.
  pc=. pc + rv msg
end.

NB. append (always appends to key directory lists)
if. 1 e. b do.
  if. badrc msg=. (code;ixn;cnn;fp;<DL) apptable b#y do.
    msg [ dfclose__DL fc return.
  end.
  pc=. pc + rv msg

NB. stamp good directory change
```

```

    (<("#.ixn);now '') jreplace fp;CNMARK
end.
dfclose__DL fc

uv=. ' ',>dnm__DL code
ok ((":pc),uv,OK057) ; DNAME__DL
end.
)

puttexts=: 4 : 0

NB.*puttexts v-- stores object documentation and group/suite
NB. texts.
NB.
NB. dyad: (iaObject ; iaOffset ;< ba) puttexts bt/blcl

NB. validate texts
if. badrc y=. checknttab y do. y return. else. y=. rv y end.

'obj offset DL'=. x NB. directory object !(*)=. DL

if. -.offset e. 0 1 do. jderr ERR090 NB. errmsg: file offset invalid
elseif. badrc uv=. (obj;<DL) inputdict {."1 y do. uv
elseif.do.

ix=. (>dnix__DL obj),'__DL' NB. directory object index noun
cn=. (>dncn__DL obj),'__DL' NB. directory object component name
fp=. "({.cn),'P__DL' NB. file pointer

```

```
NB. text components
rcn=. (.ix) i. uv=. {"1 y
rcn=. offset + rcn{"cn

NB. read components and test contents
dat=. jread fp;rcn
if. uv badcn dat do.
    jderr ERR055 return. NB. errmsg: directory-data inconsistency
end.

dat=. >dat NB. HARDCODE: group/suite index 1, document index 3
dat=. ({"1 y) (<a.;offset{1 3}) dat

if. badreps (<"1 dat) jreplace fp;rcn do.
    jderr ERR056 return. NB. errmsg: replace failure
end.

uv=. ' ',(>dnnm__DL obj),' '
ok (("#rcn),uv,(>offset{'text';'document'),OK057) ; DNAME__DL
end.
)

putwords=: 4 : 0

NB.*putwords v-- stores words in the words file. Result is a
NB. return code and message.
NB.
```

```
NB. dyad: (cl ; baObj) putwords blclWords
NB.
NB. ('locale';<<'2') putwords 'words';'are';'us'

if.      badrc uv=. checknames y do. uv
elseif. y=. ~.}.uv      NB. unique deblanked names
      'loc DL'=. x      NB. source locale and directory object !(*)=. DL
      b=. wex uv=. y ,&.> locsfx loc NB. do words exist
      0 e. b do. (jderr ERR053) , (-.b)#uv NB. errmsg: word(s) do not exist
NB. insure word directory is ready
elseif. loadaddr__DL WORD do.
      jderr ERR054 NB. errmsg: unable to load directory
elseif. do.

      NB. words are either new or replacements
      uv=. WORDIX__DL i. y
      b=. uv = #WORDIX__DL
      pc=. 0

      dfopen__DL 'W'
      NB. replace words (will not change key directory lists)
      if. 0 e. b do.
        dropnc__DL WORD NB. replacements can change word class
        if. badrc msg=. x rplcwords (<(-.b)#y),<(-.b)#uv do.
          msg [ dfclose__DL 'W' return.
        end.
      pc =. pc + rv msg
```

```
end.

NB. append new words (always appends to key directory lists)
if. 1 e. b do.
  dropnc__DL WORD NB. new words - force reload of name class if necessary
  if. badrc msg=. x appwords b#y do. msg [ dfclose__DL 'W' return. end.
  pc=. pc + rv msg

  NB. stamp good directory change
  (<(#WORDIX__DL);now '') jreplace WP__DL;CNMARK
end.
dfclose__DL 'W'

ok ((":pc),OK051) ; DNAME__DL
end.
)

putwordxrs=: 4 : 0

NB.*putwordxrs v-- stores global word references
NB.
NB. dyad: (cl ;< ba) putwordxrs blcl

'name DL'=. x NB. directory object !(*)=. DL

NB. check path prior to storing or changing references
if. badrc msg=. checkpath DL do. msg
elseif. loadref__DL WORD do. jderr ERR079 NB. errmsg: unable to load references
```

```
elseif.do.
```

```
NB. word references are either new or replacements
```

```
pos=. WORDPREFIX__DL i. <name
```

```
b=. pos = #WORDPREFIX__DL
```

```
NB. categorize references and test for path existence
```

```
if. #y=.catrefs y do.
```

```
  if. badrc uv3=. pathnl WORD do. uv3 return. end.
```

```
  if. 0 e. uv2=. (uv=. 0{::y) e. ;}.uv3 do.
```

```
    (jderr ERR083),uv #~ -.uv2 return. NB. errmsg: not on path
```

```
  end.
```

```
end.
```

```
dfopen__DL 'U'
```

```
fp=. UP__DL
```

```
uv3=. 0
```

```
if. b do.
```

```
NB. append new references
```

```
NB. append only non-null lists
```

```
if. #y do.
```

```
NB. append reference list
```

```
y=. <name;WORD;<y
```

```
if. badappend cn=. y jappend fp do.
```

```
  jderr ERR058 [ dfclose__DL 'U' return. NB. errmsg: append failure
```

```
end.
```



```

    uv=. WORDREFIX__DL , <name
    uv2=. WORDREFCN__DL , cn
    uv3=. 1
end.
else.
    NB. replace references (removing nulls if necessary)
    NB. NIMP directory-data consistency check
    if. #y do.
        NB. non-null replacement list
        y=. <name;WORD;<y
        if. badreps y jreplace fp;pos{WORDREFCN__DL do.
            jderr ERR056 [ dfclose__DL 'U' return. NB. errmsg: replace failure
        end.
    else.
        NB. replacement has no references remove from directory
        uv3=. 0 pos} (#WORDREFIX__DL)#1
        uv=. uv3#WORDREFIX__DL
        uv2=. uv3#WORDREFCN__DL
        uv3=. 1
    end.
end.

NB. update reference directory and close
if. uv3 do.
    if. badrc msg=. (WORD,fp) saveref__DL uv;uv2 do. msg [ dfclose__DL 'U' return. end.
end.
dfclose__DL 'U'

```

```
    ok ('<',name,'>',OK056) ; DNAME__DL
end.
)

rplctable=: 4 : 0

NB.*rplctable v-- replaces (name,text) and (name,type,value) tables to file.
NB.
NB. dyad:  bl rplctable (btTable ,< ilPositions)

'ttype ixn cnm fp DL'=. x  NB. directory object !(*)=. DL
y=. 0 [ 'tab pos'=. y

sizes=. #&> {"1 tab
tc=. #tab [ cn=. pos{"1.cnn
pf=. PUTFACTOR__DL

NB. for words and macros record class/type
if. wmt=. ttype e. WORD,MACRO do.
    class=. ; 1 {"1 tab
end.

while. #tab do.
    cnt=. pf <. #tab
    tn=. cnt{"1.tab [ rcn=. cnt{"1.cn

    NB. read components and test contents
```

```
dat=. jread fp;rcn
if. ({."1 tn) badcn dat do.
  jderr ERR055 return. NB. errmsg: directory-data inconsistency
end.

NB. replace
if. badreps (<"1 tn) jreplace fp;rcn do.
  jderr ERR056 return. NB. errmsg: replace failure
end.

tab=. cnt}.tab [ cn=. cnt}.cn
end.

NB. set up replacements
if. wmt do.
  dropnc__DL ttype NB. replacements can change class/type
  invcmps=. CNCLASS,CNPUTDATE,CNSIZE
  reps=. pos;<class;(tc#nowfd now '');sizes
else.
  invcmps=. CNPUTDATE,CNSIZE
  reps=. pos;<(tc#nowfd now '');sizes
end.

if. badrc msg=. reps invreplace fp;invcmps do. msg else. ok tc end.
)

rplcwords=: 4 : 0
```

```
NB.*rplcwords v-- replaces extant words.

'loc DL'=. x NB. directory object !(*)=. DL
'names pos'=. y
cn=. pos{WORDCN__DL
wc=. #pos

wp=. WP__DL [ pf=. PUTFACTOR__DL
lnames=. names ,&.> locsfx loc
size=. class=. i.0

while. #names do.
  cnt=. pf <. #names
  wn=. cnt{.names [ lwn=. cnt{.lnames [ rcn=. cnt{.cn

  NB. read components and test contents - this slows things
  NB. down but significantly improves database hygiene
  dat=. jread WP__DL;rcn
  if. wn badcn dat do.
    jderr ERR055 NB. errmsg: directory-data inconsistency
  end.

  val=. wrep&.> lwn NB. word values
  bsz=. #&> val NB. NIMP word byte sizes (size test)
  bnc=. nc lwn NB. word name class
  val=. , <"1 wn ,. (<"0 bnc) ,. val
```

```
NB. replace words
if. badreps val jreplace wp;rcn do.
  jderr ERR056 NB. errmsg: replace failure
else.
  size=. size , bsz
  class=. class , bnc
end.

names=. cnt}.names [ lnames=. cnt}.lnames [ cn=. cnt}.cn
end.

msg=. ERR057 NB. errmsg: directory update failure
if. wc ~: #size do. jderr msg return. end.

reps=. pos;<class;(wc#nowfd now '');size
if. badrc msg=.reps invreplace wp;CNCLASS,CNPUTDATE,CNSIZE do. msg else. ok wc end.
)

NB. raise, nub and sort bblcl name lists
sortdnub=: [: /:~ [: ~. ;
```

jodmake Source Code

*NB. *jodmake c-- script making & code manipulation: extension of (jod).*

NB.

NB. This subclass defines utilities for making scripts from

NB. groups and suites. It also contains code for analyzing

NB. name references in J words.

NB.

NB. Interface nouns & verbs:

NB. getallts gets all timestamps

NB. makedump dumps objects on path to put dump directory

NB. makegs make group and suite scripts

NB. namecats classifies names in J code

NB. putallts puts all timestamps - see (getallts)

NB. wttext word and test text

NB. wrdglobals extracts global names from J code

NB.

NB. Notes:

NB. Error messages (jodmake range 150-199)

```
coclass 'ajodmake'
```

```
coinert 'ajod'
```

*NB.*dependents x-- objects with definition dependencies*

NB. tags JOD dump script rebuild commands

```
DUMPTAG=: ' NB.{*JOD*}'
```

NB. large text wrap temporary noun name and line width
WRAPTMPWID=: 'zz';67

NB. expression that clears scratch object
SOCLEAR=: '".soclear',DUMPTAG

NB. expression that rebuilds groups and suites from scratch object data
SOGRP=: ' grp&> ". ". ''',(>&{.WRAPTMPWID),'_',SOLOCALE,'_' [cocurrent ''base'',DUMPTAG

NB. expression that stores words in the scratch object in JOD
SOPUT=: 'soput ". ''nl_',SOLOCALE,'_' i.4' [cocurrent ''base'',DUMPTAG

NB. expression that stores (name,text) tables in scratch object
SOPUTTEXT=: ' put ". ". ''',(>&{.WRAPTMPWID),'_',SOLOCALE,'_' [cocurrent ''base'',DUMPTAG

NB. expression that switches to numbered scratch locale
SOSWITCH=: 'cocurrent SO__JODobj',DUMPTAG

*NB.*enddependents*

*NB.*end-header*

DUMPSGO=: 'NB. JOD dictionary dump: '

DUMPSG1=: 'Names & DidNums on current path'

```
DUMPMSG2=: ''NB. end-of-JOD-dump-file regenerate cross references with: 0 globs&> }. revo '''''''' '''
```

```
DUMPMSG3=: 'NB. Generated with JOD version'
```

```
DUMPMSG4=: 'NB. J version: '
```


ERR0158=: 'invalid fully qualified dump file name'

ERR0159=: 'mixed assignments ->'

ERR0160=: 'invalid object timestamp table'

NB. multiplicative factor for small text dumps

EXPLAINFAC=: 10

NB. first table of valid single line explicit headers

EXPPFX0=: 4 5\$'1 : '2 : '3 : '4 : ''

NB. second table of valid single line explicit headers

EXPPFX1=: 3 8\$'3 : (':'3 : (,':4 : (,':'

NB. report labels for reference case of (globs)

GLOBCATS=: <;._1 ' Global Local (*)=: (*)=. for.'

NB. string marking end of class header

HEADEND=: 'NB.*end-header'

NB. explicit J argument names

JARGS=: <;._1 ' x y u v m n \$:'

NB. mixed assignment override tag

MIXEDOVER=: '(<:)=:'

```
OK0150=: 'file saved ->'
```

```
OK0151=: 'object(s) on path dumped ->'
```

```
NB. portable box drawing characters
```

```
PORTCHARS=: ,:'+++++++|-'
```

```
NB. name of monadic identity verb that displays and passes argument
```

```
SOPASS=: 'showpass '
```

```
btclfrcl=: 3 : 0
```

```
NB.*btclfrcl v-- inverse of clfrbtcl.
```

```
NB.
```

```
NB. monad: btcl =. btclfrcl cl
```

```
NB. length of prefix
```

```
len=. "(pos=. y i. ' '){. y
```

```
y=. (>:pos) }. y
```

```
NB. prefix and shape of bt
```

```
shp=. 2 {. pfx=. ". len {. y
```

```
pfx=. 2 }. pfx
```

```
tab=. len }. y
```

```
if. #tab do.
```

```
zm=. 0<pfx
```

```
bm=. 0 #~ #tab
ri=. }:0,+/\zm#pfx
bm=. 1 ri } bm
shp $ zm #^:_1 bm <;.1 tab
else.
  shp$<' ' NB. all nulls
end.
)

clearso=: 3 : 0

NB.*clearso v-- empty scratch object.
NB.
NB. monad: clearso uuIgnore

if. #s=. nl__SO i.4 do. (4!:55) s ,&.> locsfx SO end. NB. !(*)=. SO
)

clfrbtcl=: 3 : 0

NB.*clfrbtcl v-- btcl to encoded cl.
NB.
NB. This verb converts a boxed table of character lists to a cl
NB. representation that can be used to recreate the boxed table.
NB. It is used instead of (5!:5) for btcl as (5!:5) generates a
NB. large a. index representation for character data when
NB. selected "control" characters are present.
```

```
NB.  
NB. monad:  cl =. clfrbtcl btcl  
  
NB. shape and lengths of all char lists  
sp=. $ y  
lc=. , #&> y  
  
NB. first number is length of prefix  
pfx=. ":sp,lc  
(":$pfx),' ',pfx, ;y  
)  
  
createmk=: 3 : 0  
  
NB.*createmk v-- initializes maker objects  
NB.  
NB. monad:  createmk blObrefs  
NB.  
NB.    createmk__MK JOD;ST;MK;UT;<SO  
  
NB. object references !(*)=. JOD ST MK UT SO  
'JOD ST MK UT SO'=: y  
)  
  
dec85=: 3 : 0  
  
NB.*dec85  v-- decodes ASCII85  (name,text)  and (name,code,text)
```

```
NB. tables.
NB.
NB. monad: cl55=. dec85 cl

tab=. fromascii85 y
tab=. btclfrcl tab

NB. there are two types of tables in JOD (name,text) and (name,code,text)
assert. ({$tab) e. 2 3

if. 3={$tab do.
  NB. codes must be integers in JOD name,code,text tables
  codes=. <a.;1
  val=. ".&.> codes { tab
  tab=. val codes } tab
end.

NB. put commands are expecting (5!:5) strings
5!:5 <'tab'
)

dumpdictdoc=: 3 : 0

NB.*dumpdictdoc v-- appends dictionary documentation text to
NB. dumpfile.
NB.
NB. monad: dumpdictdoc clPathFile
NB.
```

NB. dumpdictdoc 'c:\go\ahead\dump\my\dictionary.ijs'

NB. cannot fetch document or document is empty

```
if. badrc uv=. DICTIONARY get '' do. (jderr ERR0155),<y return. end.
```

```
if. 0=#uv=. >1{uv do. OK return. end.
```

```
tag=. DUMPTAG,LF
```

```
putso=. (2#LF),SOSWITCH,LF
```

NB. expression to store dictionary documentation text in scratch locale

```
soputdoc=. SOPASS,(":DICTIONARY),' put >1{,",".'zz_',SOLOCALE,'_' [ cocurrent ''base'' ',tag
```

NB. format document text for dump

```
dicdoc=. putso,WRAPTMPWID fmtdumpstext ,:'';uv
```

```
dicdoc=. dicdoc,LF,soputdoc,SOCLEAR,2#LF
```

NB. append dictionary documentation error msg: unable to append to dumpfile

```
if. _1 -: (toHOST dicdoc) fap <y do. (jderr ERR0155),<y else. OK end.
```

```
)
```

```
dumpdoc=: 4 : 0
```

*NB.*dumpdoc v-- dumps object documentation text.*

NB.

NB. dyad: (iaBlksize ; iaObject ; clPathfile) dumpdoc blclNames

NB.

NB. (0;50;'c:\dump\on\me.ijcs') dumpdoc ;:'word name list'

NB. block size, object, output file

'blk obj out'=. x

NB. append short and long object documentation - short documents are small

NB. hence we process in blocks (EXPLAINFAC) times larger than the dump block

if. badrc uv=. ((EXPLAINFAC*blk);(obj,EXPLAIN);out) dumptext y do. uv

elseif. badrc uv=. (blk;(obj,DOCUMENT);out) dumptext y do. uv

elseif.do. OK

end.

)

dumpgs=: 4 : 0

*NB.*dumpgs v-- dump groups and suites on path.*

NB.

NB. dyad: iaBlksizeObject dumpgs clPathFile

NB.

NB. (50,GROUP) dumpgs 'c:\dump\your\groups.ijs'

'dmp obj'=. x

putso=. LF,SOSWITCH,LF

cmd=. SOPASS,(":obj),SOGRP,LF,SOCLEAR,LF

out=. <y

if. badrc uv=. obj dnl '' do. uv

elseif. a: e. uv do. OK *NB. no groups or suites*

elseif.do.

```
uv=. (-dmp) <\ uv=.}.uv
for_blk. uv do.

  NB. get blblcl of all objects in groups/suites
  gnames=. obj grp&.> >blk

  NB. check all return codes error msg: unable to dump group/suite list(s)
  if. 0 e. {.&> gnames do. jderr ERR0157 return. end.

  NB. remove return codes, attach group/suite names and format as text
  gnames=. (<"0 >blk) ,&.> }.&.> gnames
  gnames=. 5!:5 <'gnames'

  NB. append if any text
  if. #gnames=. WRAPTMPWID wraplinear gnames do.
    gnames=. toHOST putso,gnames,LF,cmd
    if. _1 -: gnames fap out do. (jderr ERR0155),out return. end.
  end.

end.

NB. dump group/suite header scripts
if. badrc msg=. (dmp;obj;y) dumptext ;uv do. msg return. end.

NB. dump group/suite documentation
if. badrc msg=. (dmp;obj;y) dumpdoc ;uv do. msg return. end.
end.
```


OK

)

dumpheader=: 3 : 0

*NB.*dumpheader v-- creates the dumpfile and writes header
NB. information.*

NB.

NB. monad: dumpheader clPathFile

NB.

NB. dumpheader 'c:\go\ahead\dump\my\dictionary.ijs'

NB. error msg: unable to create dumpfile

if. _1 -: '' (write :: _1:) y do. (jderr ERR0156),<y return. end.

NB. make box characters portable

9!:7 , PORTCHARS [curchars=. , 9!:6 ''

NB. format header text

head=. DUMPMSG0 , tstamp ''

head=. head,LF,DUMPMSG3 , ;(<' ; ') ,&.> " :&.>JODVMD

head=. head,LF,DUMPMSG4 , " : , 9!:14 ''

head=. head,LF,ctl 'NB. ', "1 ' ' , DUMPMSG1 , " : 0 1 {"1 DPATH__ST

head=. head,LF,LF

NB. reset box characters

9!:7 curchars

```
NB. set up J environment to process script - assumes that
NB. JOD is loaded and that a target put dictionary is open
tag=. DUMPTAG,LF

NB. retain white space
head=. head,'9!:41 [ 1',tag

head=. head,'cocurrent ''base'',tag
head=. head,'sonl_z_=: ''sonl__MK__JODobj i.4'',tag
head=. head,(SOPASS-.' '),'_z_=:] [ 1!:2&2',tag
head=. head,'SOLOCALE_z_=: ">SO__JODobj',tag
head=. head,'soput_z_=:SOLOCALE&put',tag
head=. head,'soclear_z_=: ''0 0 $ clearso__MK__JODobj 0'',tag

NB. append header error msg: unable to append to dumpfile
if. _1 -: (toHOST head) fap <y do. (jderr ERR0155),<y else. OK end.
)

dumpntstamps=: 4 : 0

NB.*dumpntstamps v-- appends object timestamps text to dumpfile.
NB.
NB. dyad: paRag dumpntstamps clPathFile
NB.
NB. 1 dumpntstamps'c:\go\ahead\dump\my\dictionary.ijs'

if. x do.
```

NB. fetch all object timestamps

```
if. badrc ots=. getallts 0 do. ots return. else. ots=. rv ots end.
```

NB. if no objects exist dump nothing

```
if. 0 = >./ , #&> (0 1){ots do. OK return. end.
```

```
tag=. DUMPTAG,LF
```

```
putso=. LF,SOSWITCH,LF
```

NB. make sure older versions of JOD can execute dumps with timestamps without errors.

```
putup=. 'cocurrent 'base' ',tag
```

```
putup=. putup, 'puttstamps_ijod=: (((1;'upgrade JOD''))_)`putallts__MK__JODobj)@.(3 = (4!:0)<'putallt  
>..> s__MK__JODobj'')',tag
```

NB. expression to store timestamps from text in scratch object

```
soputts=. putup,SOPASS,'puttstamps "'. 'zz_',SOLOCALE,'_' [ cocurrent 'base' ',tag
```

NB. text in scratch object

```
tstext=. putso,(WRAPTMPWID,(getascii85 0);<1) wraplinear 5!:5 <'ots'
```

```
tstext=. tstext,LF,soputts,SOCLEAR,2#LF
```

NB. write to test file

NB. (toHOST tstext) write jpath '~temp/dumpnts.ijs'

NB. append timestamps msg: unable to append to dumpfile

```
if. _1 -: (toHOST tstext) fap <y do. (jderr ERR0155),<y else. OK end.  
else.
```

```
    OK
end.
)
```

```
dumptext=: 4 : 0
```

```
NB.*dumptext v-- appends text tables to dump file.
```

```
NB.
```

```
NB. dyad: (iaBlksize ; ilObjCode ; clPathFile) dumptext blclNames
```

```
NB.
```

```
NB. (50;1 8;'c:\temp\dump.ijs') dumptext ;:'test case names'
```

```
NB. block size, object & option code, output file
```

```
'bsize noc out'=. x
```

```
out=.<out
```

```
bnames=.(-bsize) <\ y
```

```
putso=. LF,SOSWITCH,LF
```

```
NB. reload command for object
```

```
cmd=. SOPASS,(":noc),SOPUTTEXT,LF,SOCLEAR,LF
```

```
NB. dump text in blocks
```

```
for_blk. bnames do.
```

```
    if. badrc uv=. noc get >blk do. uv return. else. uv=. rv uv end.
```

```
NB. append only when we have text
```

```
if. #uv=. WRAPTMPWID fmtdumptext uv do.
```

```
uv=. toHOST putso,uv,LF,cmd
  NB. error msg: unable to append to dumpfile
  if. _1 -: uv fap out do. (jderr ERR0155),out return. end.
end.

end.
OK
)

dumptm=: 4 : 0

  NB.*dumptm v-- dumps test cases and macros on path.
  NB.
  NB. dyad: ilBlksizeObject dumptm clPathFile
  NB.
  NB. 50 1 dumptm 'c:\dump\on\me.igs'

  'blk obj'=. x

  if. badrc uv0=. obj dnl '' do. uv0 return. end.
  if. a: e. uv0 do. OK return. end. NB. no test cases or macros

  if. #uv0=. }.uv0 do.
    if. badrc uv1=. (blk;obj;y) dumptext uv0 do. uv1 return. end.
    if. badrc uv1=. (blk;obj;y) dumpdoc uv0 do. uv1 return. end.
  end.
  OK
)
```

```
dumptrailer=: 3 : 0
```

```
NB.*dumptrailer v-- appends terminal text to dumpfile.
```

```
NB.
```

```
NB. monad: dumptrailer clPathFile
```

```
NB.
```

```
NB. dumptrailer 'c:\go\ahead\dump\my\dictionary.ijs'
```

```
tag=. DUMPTAG,LF
```

```
tail=. LF,'cocurrent ''base'',tag
```

```
tail=. tail,'0 0$(4!:55);:''sonl_z_ SOLOCALE_z_ soput_z_ soclear_z_',tag
```

```
tail=. tail,SOPASS,DUMPMMSG2,tag
```

```
NB. append trailer error msg: unable to append to dumpfile
```

```
if. _1 -: (toHOST tail) fap <y do. (jderr ERR0155),<y else. OK end.
```

```
)
```

```
dumpwords=: 4 : 0
```

```
NB.*dumpwords v-- dumps path words to an ASCII script file. Nouns
```

```
NB. are dumped first in alphabetic order and then remaining words
```

```
NB. are dumped in alphabetic order.
```

```
NB.
```

```
NB. dyad: iaBlockSize dumpwords clPathFile
```

```
NB.
```

```
NB. 50 dumpwords 'c:\j405\addons\jod\joddev\dump\joddev.ijs'
```

```
NB. dump all nouns
```

```
if. badrc nouns=. did 0 do. nouns return.
else.
  if. 2=#nouns do. NB. HARDCODE 2
    NB. only one dictionary on the path - common case
    if. badrc nouns=. (WORD,1,WORD) dnl '' do. nouns return. else. nouns=. }. nouns end.
  else.
    NB. more than one dictionary on path - requires deeper look to determine
    NB. whether a path order fetched word is a noun or something else
    if. badrc nouns=. 0 _1 0 dnl '' do. nouns return. end.
    if. badrc other=. 0 _1 dnl '' do. other return. end.

    other=. }.other
    nouns=. }.nouns
    other=. other -.&.> nouns

    NB. sorted list of nouns that will be retrieved in path order
    nouns=. /:~ ~. ; nouns -.&.> ~.@:;&.> <"1 ,\ other

  end.
end.

putclr=. LF,LF,SOPASS,SOPUT,LF,SOCLEAR
putso=. LF,SOSWITCH,LF
noc=. WORD,0
out=. <y
space=. 2          NB. generates one blank line between objects
wnc=. WORD,INCLASS NB. word name class code
```

```
if. (0<#nouns) *. -. a: e. nouns do.
  if. badrc wnc=. (WORD,INCLASS) invfetch__ST nouns do. wnc return.
  else. wnc=(-x) <\ rv wnc
  end.
  names=. (-x) <\ nouns
  for_blk. names do.

    NB. get block of nouns
    if. badrc uv=. noc getobjects__ST >blk do. uv return. else. uv=. rv uv end.

    NB. check component-directory name class for consistency - classes must
    NB. be consistent to insure that the dump script can properly reload
    if. 1 e. mask=-.(>blk_index{wnc) = ; 1 {"1 uv do.
      NB. error msg: directory-component name class inconsistency -- dump aborted
      (jderr ERR0157),mask#0{"1 uv return.
    end.

    NB. convert to linear representations
    NB. NIMP not wrapping large binaries
    if. badrc uv=. 0 nounlrep uv do. uv return. else. uv=.rv uv end.
    uv=. space jscript jscriptdefs uv

    NB. insert JOD commands to reload
    uv=. toHOST putso,uv,putclr

    NB. append to file
```



```
    if. _1 -: uv fap out do. (jderr ERR0155),out return. end.  
end.  
end.
```

NB. append all remaining words that are stored as text

```
if. badrc names=. dnl '' do. names return. else. vnc=. (names=. }.names -. a:) -. nouns end.  
nouns=.0
```

```
if. #vnc do.  
    if. badrc wnc=. (WORD,INCLASS) invfetch__ST vnc do. wnc return.  
    else. wnc=.(-x) <\ rv wnc  
    end.  
    vnc=. (-x) <\ vnc  
    for_blk. vnc do.  
        if. badrc uv=. noc getobjects__ST >blk do. uv return. else. uv=. rv uv end.  
        if. 1 e. mask=.-.(>blk_index{wnc) = ; 1 {"1 uv do.  
            (jderr ERR0157),mask#0{"1 uv return.  
        end.  
        uv=. space jscript jscriptdefs uv  
        uv=. toHOST putso,uv,putclr  
        if. _1 -: uv fap out do. (jderr ERR0155),out return. end.  
    end.  
end.
```

NB. dump word documentation

```
if. -. a: e. names do. (x;WORD;out) dumpdoc names else. OK end.  
)
```

```
extscopes=: 3 : 0
```

```
NB.*extscopes v-- handles exceptions to normal J assignment
```

```
NB. scoping rules. The exceptions are:
```

```
NB.
```

```
NB. monad: extscopes blclParsed
```

```
NB.
```

```
NB. 'quoted locals'=. 
```

```
NB. '`acr locals'=. 
```

```
NB. 'quoted globals'=: 
```

```
NB. '`acr globlas'=: 
```

```
NB.
```

```
NB. for_loopvar. x do.
```

```
NB.      $ loopvar      NB. implicit for. local references
```

```
NB.      loopvar_index
```

```
NB. end.
```

```
NB. get any quoted assignments from syntactically correct code
```

```
qlocs=. (}.@:}.) &.> u #~ '===' = {.&> u=. y #~ 1|.y = <'=. '
```

```
qgblds=. (}.@:}.) &.> u #~ '===' = {.&> u=. y #~ 1|.y = <'=: '
```

```
if. #qlocs do. qlocs=. jnfrblcl <;._1 ; ' ' ,&.> qlocs -.&.> '``' end.
```

```
if. #qgblds do. qgblds=. jnfrblcl <;._1 ; ' ' ,&.> qgblds -.&.> '``' end.
```

```
NB. get any implicit for. locals
```

```
flocs=. ''
```

```
if. +./ u=. ((4&{.&.> y) e. <'for_') *. ' ' = {:&> y do.
```

```
  u=. (4&}.@:}.)&.> u # y
```

```
u=. u , u ,&.> <['_index' NB. possible implicits
flocs=. , y #~ y e. u
end.

(<qgbis),(<qlocs,flocs),<flocs
)

NB. direct file append with error trap
fap=: 1!:3 ::(_1:)

fmtdumptext=: 4 : 0

NB.*fmtdumptext v-- formats (name,text) tables for dumping.
NB. Result is a J script character list or null.
NB.
NB. dyad: (clName ; iaWidth) fmtdumptext btNameText
NB.
NB. ('z';67) fmtdumptext 1 pick 0 8 get }. dnl ''

NB. remove null entries
if. #text=. y #~ 0 < #&> {:"1 y do.

  ascii85=. getascii85 0

  NB. The (5!:5) representation will produce
  NB. a large a. index representation when any
  NB. unprintable characters are present. To get
```

```

NB. a compact representation for ASCII85 5!:5 must
NB. be replaced in this context
if. ascii85 do. text=. clfrbtcl ":%.> text else. text=. 5!:5 <'text' end.

  (x,<ascii85) wraplinear text
else.
  ''
end.
)

fromascii85=: 3 : 0

NB.*fromascii85 v-- decode ASCII85 representation.
NB.
NB. Inverse of (toascii85).
NB.
NB. monad: cl =. fromascii85 clA85

r=. ,y
r=. a.i.r
r=. (r > 32) # r
r=. (2 * (a.i.'<~') -: 2 {. r) }. r
r=. (-2 * (a.i.'~>') -: _2 {. r) }. r
m=. r = a.i.'z'
r=. r - 33
r=. 0 (I.m) } r
r=. (1+4*m) # r
b=. 5 | #r

```

```
r=. r,84 #~ b{ 0 4 3 2 1
r=. a.{~ ,(4#256) #: 85 #. _5 [\ r
r }.~ - b { 0 0 3 2 1
)
```

```
getallts=: 3 : 0
```

*NB.*getallts v-- gets all timestamps.*

NB.

NB. Returns a boxed table of all object timestamps. The creation

NB. and lastput dates are fractional day yyyymmdd.f floats. The

NB. (5!:5) representation of floats includes all significant

NB. decimals which can bloat up linear representations. This verb

NB. applies a simple run length encoding compression scheme that

NB. can significantly reduce the number of (5!:5) bytes when the

NB. same timestamp value occurs frequently.

NB.

NB. monad: btCts =. getallts uuIgnore

NB.

NB. getallts__MK__JODobj 0

NB. last row of (cts) indicates compression scheme (0=none, 1=rle)

```
cts=. ((#OBJECTNC)#<0) (2)} (3,#OBJECTNC)$a:
```

```
inc=. -INPUT
```

```
for_obj. OBJECTNC do.
```

NB. fetch timestamps - ignore empty object lists

```

if. badrc nts=. (obj,inc) get }. obj dnl '' do. continue. end.
nts=. rv nts

NB. object names and uncompressed timestamps
cts=. (<;0{nts) (<0;obj_index)} cts
cts=. (<;1{nts) (<1;obj_index)} cts

ets=. rlefrnl , sts=. ;1{nts
NB. insure rle timestamps decode properly
if. (,sts) -: nlfrle ets do.
  NB. if run encoded timestamps are smaller use them
  if. (*/$ets) <: */$sts do.
    cts=. (<ets) (<1;obj_index)} cts
    cts=. (<1) (<2;obj_index)} cts
  end.
end.

end.

ok <cts
)

getascii85=: 3 : 0

NB.*getascii85 v-- returns ASCII85 setting (1=On, 0=Off).
NB.
NB. monad: getascii85 uuIgnore

```

```
ascii85=. 0 NB. do not use ascii85 default

NB. if setting exists in class use it
if. 0=nc<'ASCII85' do. ascii85=. 1-:ASCII85
elseif.
  NB. if ASCII85 setting exists in put dictionary directory use it
  do=. {: {.DPATH__ST
  0=nc<'ASCII85__do' do. ascii85=. 1-:ASCII85__do
end.

ascii85
)

NB. 0's every other 1 in even groups of 1's
halfbits=: ] *. 1 0" _ $~ #

NB. clips head and tail delimited lists - see long documentation
htclip=: [ (] }~ [: >: ] i. (] ] }~ [: - [: >: [ i.~ [: |. ]

jnb=: 3 : 0
NB.*jnb v-- blanks out J code leaving only comments
y jnb~ masknb y
:
(x * >: i. $ x){' ',,y
)

NB. definition table to script text
jscrip=: [: ; (([: <"0 [) #&.> (10{a.)"_ ) ,&.> ]
```

NB. name, class, definition table to assigned name table

```
jscriptdefs=: (([: {. "1 ]) ,&.> (<'=:')"_ ) ,&.> [: {:"1 ]
```

```
makedump=: 3 : 0
```

*NB. *makedump v-- dumps the current path as a J script file. The*

NB. dump script can be run back into JOD to rebuild a single

NB. dictionary that contains all objects on the current path. The

NB. dump script is a simple ASCII file that is intended for long

NB. term storage of J words in a form that is immune to changes

NB. in binary storage formats.

NB.

NB. monad: makedump uuIgnore

NB. do we have a dictionary open?

```
if. badrc uv=. checkopen__ST 0 do. uv return. end.
```

NB. create dump file in put dump directory !()=. DL*

```
DL=: {:{.DPATH__ST
```

NB. dumpfactor is set from the put dictionary

```
df=: DUMPFACOR__DL
```

NB. default dump file name is the put dictionary name

```
if. isempty y do. dumpfile=: DMP__DL,DNAME__DL,IJS
```

```
elseif. badcl y do. jderr ERR0158 return. NB. error msg: invalid dump file
```

```
elseif.do. dumpfile=: y
```

```
end.
```


NB. HARDCODE: are we retaining object age?

```
if. 0=nc<'RETAINAGE__DL' do. rag=. 1 -: RETAINAGE__DL else. rag=. 0 end.
```

NB. standardize path character

```
dumpfile=. jpathsep dumpfile
```

```
if.      badrc uv=. dumpheader dumpfile      do. uv
elseif.  badrc uv=. df dumpwords dumpfile      do. uv
elseif.  badrc uv=. (df,TEST) dumptm dumpfile do. uv
elseif.  badrc uv=. (df,MACRO) dumptm dumpfile do. uv
elseif.  badrc uv=. (df,GROUP) dumpgs dumpfile do. uv
elseif.  badrc uv=. (df,SUITE) dumpgs dumpfile do. uv
elseif.  badrc uv=. dumpdictdoc dumpfile      do. uv
elseif.  badrc uv=. rag dumpntstamps dumpfile do. uv
elseif.  badrc uv=. dumptrailer dumpfile      do. uv
elseif.do.
  (ok OK0151),<dumpfile
end.
)
```

```
makegs=: 4 : 0
```

*NB.*makegs v-- make group and suite scripts. Objects are*

NB. assembled by name class and within class alphabetically.

NB.

NB. dyad: iaObject makegs clName

NB.

NB. 2 makegs 'group'

```
'obj wf'=. x
DL=.{: {.DPATH__ST
```

*NB. for postive option codes generate files only if the object
NB. is in the put dictionary for negative codes generate files
NB. regardless of where on the path it occurs. Generated files
NB. are ALWAYS written to the put dictionary script directory*
wf=. |wf [po=. 0<wf

NB. errmsg: invalid group/suite name
if. (isempty +. badcl) y do. jderr ERR0154 return. end.
if. badrc head=. obj getgstext__ST y do. head return. end.

NB. generate files for dictionary objects
if. (1=wf) *. po do.
 if. badrc uv=. (obj;<DL) inputdict__ST <y=. y-. ' ' do. uv return. end.
end.

NB. get group or suite list and generate text
if. badrc uv=. obj gslistnl__ST y do. uv return. end.
if. isempty >1{uv do. uv=. ''
else.
 if. DODEPENDENTS do.
 NB. process any dependent sections in headers and adjust lists
 if. badrc deps=. obj gdeps y do. deps return. else. deps=.}. deps end.

```
else.
  deps=. ''
end.
NB. dependents may empty group/suite list
if. #uv=. (}.uv)-.deps do.
  if. badrc uv=. ((obj-2),0) getobjects__ST uv do. uv return. end.
  if. badrc uv=. ((obj-2),0) wtttext rv uv do. uv return. end.
  uv=.rv uv
else. uv=. ''
end.
end.

NB. trim any header and append to word or test text
if. #head=. alltrim@:lfcrttrim (1;0 1) {:: head do. uv=. head,LF,HEADEND,LF,LF,uv end.

NB. write file or return character list result
if. 1=wf do. (obj;y) writeijs uv else. ok uv end.
)

masknb=: 3 : 0

NB.*masknb v-- bit mask of unquoted comment starts.
NB.
NB. monad: masknb ct
NB. dyad: cl masknb ct

'NB.' masknb y
:
```

```

c =. ($y)$x E. ,y
+./\"1 c > ~:/\"1 y e. ''''
)

namecats=: 4 : 0

NB.*namecats v-- extracts and classifies names in J code.
NB.
NB. dyad: pa namecats ctJcode
NB.
NB. name classifications
NB.   global          global reference or assignment
NB.   local           local reference of assignment
NB.   declared global  names marked with global comment tag (*)=:
NB.   declared local   names marked with local command tag (*)=.
NB.   override mixed   allow mixed assignments (<:)=:
NB.   for. local       implicit for. locals
NB.
NB. 0 namecats jcr 'wordname' NB. only globals
NB. 1 namecats jcr 'wordname' NB. full classification

if. badrc parsed=. parsecode y do.
  parsed NB. parse error
else.
  'dgblds dlocs parsed'=. }. parsed

NB. handle quoted assignments and implicit for. locals
'mgblds mlocs flocs'=. extscopes parsed

```

NB. declarations override other scopes

```
mgblds=. mgblds -. dlocs [ mlocs=. mlocs -. dgblds
gblds=. dgblds,mgblds [ locs=. dlocs,mlocs
```

NB. pick out assignments

```
parsed=. parsed -. ;:')'
uv0=. parsed #~ 1|.parsed = <'=. '
uv1=. parsed #~ 1|.parsed = <'=: '
```

NB. forbid names from being both local and global

```
uv1=. uv0 -. uv0 -. uv1
```

NB. errmsg: mixed scopes

```
if. 0 < #uv1 do.
```

NB. check for mixed assignment override

```
  if. -.MIXEDOVER +./@E. ,y do. (jderr ERR0159),uv1 return. end.
end.
```

```
uv1=. parsed -. uv0
```

```
gblds=. gblds , (jnfrblcl uv1) -. locs,JARGS
```

```
if. x do.
```

NB. complete name classification

```
locs=. locs,jnfrblcl uv0
```

```
uv1=. (<gblds),(<locs),(<dgblds),(<dlocs),<flocs
```

```
ok <GLOBCATS ,. (/::~)@::~. &.> uv1
```

```
else.  
  NB. return only unique sorted globals  
  ok /:~ ~. gbls  
end.  
end.  
)  
  
NB. numeric list from run length encoding table - see (rlefrnl) long document  
nlfrle=: #~/@:|:  
  
nounlrep=: 4 : 0  
  
NB.*nounlrep v-- converts nouns stored as binary to linear text  
NB. representations. Uses a scratch locale to temporarily define  
NB. nouns.  
NB.  
NB. dyad: iaNoex nounlrep bt  
  
NB. override mixed assignments (<:)=:  
if. #y do.  
  clearso 0  
  names=. (errnames=. {"1 y) ,&.> locsfx S0 NB. !(*)=. S0  
  try.  
    (names)=: (3!:2)&.> {"1 y  
    names=. (5!:5@<)&.> names  
  catch. (jderr ERR016),errnames return. end. NB. retain scratch on failure  
  if. x do. names=. names ,&.> LF end.
```

```
y=. names (<a.;2)} y
clearso 0
end.
ok <y
)
```

```
opaque=: 4 : 0
```

*NB.*opaque v-- extract opaque names from J code. An opaque
NB. name is a declared reference.
NB.
NB. dyad:*

```
b=. +./"1 x      NB. text mask
x=. b # x [ y=. b # y
y=. x jnb y      NB. search only comment text
if. +./ '(*)= ' E. , y do.
```

*NB. replace any single quotes ' with blanks
NB. quotes will confuse (masknb) below*

```
y=. ($y)$ ' ' ( I. (,y) = ''') } ,y
```

*NB. this is a rare instance of where HARDCODE is
NB. beneficial. The tags used to mark declared
NB. globals and locals in J code are sprinkled
NB. throughout many programs. If the tags were
NB. ever changed in this verb it would not properly
NB. process changed tags. By hardcoding the tags*

```

NB. they are difficult to change which is what I want!
locals=. (,y) #~ , '(*)=.' masknb y
locals=. ~. <;._1 ' ',locals #~ -. ' ' E. locals
locals=. <jnfrblcl locals
globals=. (,y) #~ , '(*)=:' masknb y
globals=. ~. <;._1 ' ',globals #~ -. ' ' E. globals
globals=. <jnfrblcl globals
locals,globals
else.
  '';'
end.
)

parsecode=: 3 : 0

NB.*parsecode v-- parses J word code. Normal result is a three
NB. item boxed list of boxed lists containing declared names and
NB. parsed tokens. Will return an error if given syntactically
NB. invalid J code.
NB.
NB. monad: parsecode cl/ctJcr
NB.
NB. parsecode jcr 'wordname'

if. 0 e. $parsed=. tabit y do. ok'' return.
NB. possible quoted single line explicit
elseif. 1=#parsed do. parsed=. uqtsingle parsed
end.

```

```

NB. end with a blank and compute comment mask
parsed=. parsed ,"1 ' '
mask=. masknb parsed
locs=. gbls=. ''

NB. if any declared names extract them
if. 1 e. '(*)= ' E. , parsed do.
  'locs gbls'=. mask opaqlines parsed
  olap=. locs -. locs -. gbls NB. intersection
  NB. errmsg: confused declarations
  if. 0<# olap do. (jderr ERR0150),olap return. end.
end.

NB. blank comments, clear mask and remove blank rows
mask=. 0 [ parsed=. parsed jnb~ -. mask
parsed=. parsed #~ parsed +./ . ~: ' '
parsed=. (;: :: 0:)&.> <"1 parsed NB. parse code
if. parsed e.~ <0 do.
  jderr ERR0151 NB. errmsg: word syntax
else.
  parsed=. ok(<gbls),(<locs),<;parsed
end.
)

putallts=: 3 : 0

NB.*putallts v-- puts all timestamps - see (getallts).

```

```
NB.
NB. monad: putallts btCts
NB.
NB.   cts=. getallts__MK__JODobj 0
NB.   putallts__MK__JODobj cts

NB. insure dictionaries are open
if. badrc msg=. checkopen__ST 0 do. msg return. end.

NB. HARDCODE: errmsg: invalid object timestamp table
if. -(3,#OBJECTNC) -: $y do. jderr ERR0160 return. end.

NB. put dictionary name and object names
do=. {:{.DPATH__ST
onames=. DIRNMS__do [ dname=. DNAME__do

NB. HARDCODE: shapes
inc=. -INPUT [ ecb=. ;2{y [ nots=. 0 = #&> 0{y [ msg=. i. 0 4

for_obj. OBJECTNC do.

  NB. empty object timestamps
  if. obj_index{nots do. continue. end.

  NB. object name timestamps
  nts=. (<0 1; ,obj_index){y
  uv=. 2 , #&> 0{nts
```

NB. decode any run encodings

```
if. obj_index{ecb do. nts=. (<uv $ nlfrle ;1{nts) (1)} nts end.
```

NB. store timestamps - note errors but proceed

```
msg=. msg , (2 {. (obj,inc) put nts) , (obj_index{onames) , <dname
```

```
end.
```

```
msg  
)
```

NB. run list encoding from numeric list - see long document

```
rlfrnl=: (1 ,~ 2&(~:/\)) ({. , #);.2 ]
```

```
sexpin=: 3 : 0
```

*NB.*sexpin v-- single line explicit definition test.*

```
if.      EXPPFX0 e.~ 5 {. hd=. alltrim 20 {. ,y do. 1
```

```
elseif.  EXPPFX1 e.~ 8 {. hd do. 1 NB. monad null
```

```
elseif. do. 0
```

```
end.
```

```
)
```

```
sonl=: 3 : 0
```

*NB.*sonl v-- scratch object namelist.*

NB.

NB. monad: sonl il

```
nl__S0 y
)
```

NB. promotes only atoms and lists to tables
tabit=:]`,:@.(1&>:@(#@\$))^:2

toascii85=: 3 : 0

*NB.*toascii85 v-- to ascii85 representation.*

NB.

NB. From convert/misc/ascii85 addon.

NB.

NB. Converts a list of bytes to an ASCII85 representation:

NB. essentially all the "visible" ASCII characters. Useful for

NB. encoding arbitrary byte lists as a portable stream. Returns

NB. lines of length no more than 75 + LF

NB.

NB. The encoding does not begin with <~, though sometimes this is

NB. allowed. However PDF files do not accept this prefix.

NB. Decoding does support the prefix.

NB.

NB. monad: clA85 =. toascii85 cl

```
r=. ,y
len=. #r
```

```

assert. 4 <: len NB. fails on short cl
r=. 256 #. _4[\ a.i.r
m=. 0 (_1) } r = 0
n=. 5 * I.m
r=. a. {~ 33 + ,(5#85) #: r
r=. 'z' n } r
m=. 1 n } 5 # -. m
r=. m # r
r=. (- (4|len) { 0 3 2 1) }. r
r=. }: ,(_75 [\ r),.LF
('~>',LF) ,~ (r i: ' ') {. r
)

uqtsingle=: 3 : 0
NB.*uqtsingle v-- unquotes single line explicit definitions
if. sexpin y do.
  m99=. '''' htclip alltrim ,y
  m99=. tabit m99 #~ -. halfbits '''' = m99
  ]`(''''&,"1)@.(':''''&-:@(2&{. @,)) m99 NB. correct dyad
else.
  y
end.
)

wraplinear=: 4 : 0

NB.*wraplinear v-- wraps the linear representation of large J

```

```
NB. objects into a series of script lines.
NB.
NB. The linear form of large J objects can produce very long
NB. lines in script files. Many editors cannot deal with very
NB. long lines. This verb produces an equivalent representation
NB. that can always be edited.
NB.
NB. dyad: (clTempName ; iaWidth) wraplinear clLinear
NB.       (clTempName ; iaWidth ; paAscii85) wraplinear clLinear
NB.
NB. ('z';67) wraplinear 5!:5 <'bighonkingarray'
NB. ('z';67;1) wraplinear btcl
NB. ('z';67;1;1) wraplinear cl

NB. temporary noun name, line length, ascii85 representation
'temp width ascii85 tablst'=. 4 {. x,0;<0

if. ascii85 do.
  NB. use ASCII85 encoding. This representation is
  NB. about three times more compact than the default
  NB. representation but requires roughly three times
  NB. the CPU with current algorithms to encode/decode
  decoder=. (;tablst{'dec85';'fromascii85'),'__MK__JODobj 0 : '
  temp, '=: ',decoder, ' 0',LF,')' ,~ toascii85 y
else.
  head=. temp, '=: ''''''          NB. null header
  tail=. temp, '=: ',(':#y),'{.',temp NB. trim to correct length
```

```
line=. temp, '=: ', temp, ', '          NB. next line

NB. wrap text and insure each line is properly quoted
body=. ctl line , "1 quote"1 (-width) ]\ y
head,LF,body,LF,tail
end.
)

wrddglobals=: 4 : 0

NB.*wrddglobals v-- extracts names from J words. Assumes name is
NB. valid.
NB.
NB. dyad: pa wrddglobals clName
NB.
NB. 0 wrddglobals 'wordname' NB. only globals
NB. 1 wrddglobals 'wordname' NB. full name classification

code=. jcr :: 0: y
NB. errmsg: no definition
if. code -: 0 do. (jderr ERR0152),<y else. x namecats code end.
)

writeijs=: 4 : 0

NB.*writeijs v-- writes file to put dictionary directory
NB.
```

```
NB. dyad: (iaObject ; clFile) writeijs clText

'obj file'=. x
DL=.{:{:DPATH__ST
NB. get put dictionary script directory
path=.jpathsep dfp__DL obj
m=. (toHOST y) (write :: _1:) path=.path,file,IJS
NB. errmsg: file write failure with target path and file appended
if. m -: _1 do. (jderr ERR0153),<path else. (ok OK0150),<path end.
)

wttext=: 4 : 0

NB.*wttext v-- returns annotated word or test text.
NB.
NB. This verb converts dictionary words and tests to formatted
NB. script text. (y) is a boxed (name,class,value) or
NB. (name,value) table. The result is either a single cl script
NB. or a btcl of object scripts.
NB.
NB. dyad: (paRc ; blcl) =. iaObjExFtab wttext bt
NB.      (paRc ; btcl) =. iaObjExFtab wttext bt

NB. object code, explanation bit, formatted table bit
NB. default table bit is off - this verb is frequently
NB. called with a two item (x) argument
'obj noex nftab'=. 3{x,0
```



```

if. WORD=obj do.
  y=. (/: ; 1 {"1 y){y      NB. sort words by name class
  nr=. ((; 1 {"1 y)>0) i. 1
  NB. convert noun values to linear representations
  if. badrc m2=. noex nounlrep nr{.y do. m2 return. end.
  y=. (rv m2) , nr}.y
end.

if. nftab do. nms=. 0 {"1 y end. NB. retain sorted names

if. noex do.
  NB. no explanations and no LF's depends on caller
  m=. (#y)#0
elseif. +./m=. -.LF e.&> {"1 y do.
  NB. prefix any short explanations for single line definitions
  m2=. m#{"1 y
  if. badrc et=. obj getexplain__ST m2 do. et return. end.
  m2=. 0<#&> et=. {"1 rv et
  et=. (<"0 m2) #&.> (<'NB. ') ,&.> et ,&.> LF
  y=. (et ,&.> m#{"1 y) (<(I. m);0)} y
  NB. number of LF's between corresponding objects
  m=. (>:2*-.m) + m (#^:_1) m2
  m=. m + 2*firstone 1=m
elseif.do.
  NB. 3 LF's between all multi-line defs HARDCODE
  m=. (#y)#3
end.

```

NB. construct J object scripts

```
if. WORD=obj do. y=.jscriptdefs y else. y=. {"1 y end.
```

NB. return formated (name,script) table or cl script

```
if. nftab do. ok <nms ,. y else. ok ({.m}).m jscript y end.  
)
```

jodutil Source Code

*NB. *jodutil c-- a collection of JOD utility words: extension of (jod).*

NB.

NB. This subclass defines a set of handy utilites that use the core

NB. facilities of JOD to perform tasks of general use to J programmers.

NB.

NB. Interface nouns & verbs:

NB. compj extreme compression of dictionary words

NB. de drop error code from JOD results

NB. disp display dictionary objects

NB. doc format comments in words and documents

NB. ed edit objects from JOD

NB. et edit text

NB. gt get text out of edit windows

NB. revo list recently revised objects

NB. rm run macros

NB. rtt run tautology tests

NB. jodhelp browse PDF online help

NB.

NB. Notes:

NB. error & ok messages (jodutil range 00250-00399)

```
coclass 'ajodutil'
```

```
coinsert 'ajod'
```

*NB.*dependents d-- dependent words*

NB. documentation mark for assumes

ASSUMESMARK=: 'assumes:'

NB. documentation mark for author

AUTHORMARK=: 'author:'

NB. documentation mark for created

CREATEDMARK=: 'created:'

NB. documentation mark for dyad hungarian and examples

DYADMARK=: 'dyad:'

NB. documentation mark for monad hungarian and examples

MONADMARK=: 'monad:'

NB. documentation mark for verbatim

VERBATIMMARK=: 'verbatim:'

NB. documentation mark for root words

ROOTWORDSMARK=: 'rootwords:'

NB. documentation marks - depends on other marks

DOCUMENTMARKS=: ASSUMESMARK;AUTHORMARK;CREATEDMARK;DYADMARK;MONADMARK;VERBATIMMARK;ROOTWORDSMARK

NB. command line quotes OS dependent: jod !()=. dblquote*

qt=:]`dblquote@.IFWIN

*NB.*enddependents*

*NB.*end-header*

NB. remove only white space tag

CWSONLY=: '(-.)=:'

NB. text editor to use when running JOD in jconsole on Windows systems

EDCONSOLE=: '"c:\Program Files\Microsoft VS Code\code.exe"'

NB. default edit file name

EDTEMP=: '99'

ERR0250=: ' is a noun no internal document'

ERR0251=: 'not loaded - load'

ERR0252=: 'not J script(s) ->'

ERR0253=: 'invalid locale name'

ERR0254=: 'unable to get TEMP/*.ijs text'

ERR0255=: 'unable to open TEMP/*.ijs for editing'

ERR0256=: 'J error in script ->'

ERR0260=: 'PDF reader not found'

ERR0261=: 'macro is not a J script - not formatted'

ERR0262=: 'not supported on current J system'

NB. jodutil interface words

IzJODutinterface=: <;._1 ' compj de disp doc ed et gt jodhelp revo rm rtt'

NB. valid characters in J names

NAMEALPHA=: 'abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789_'

NB. obfuscate local identifiers tag

OBFUSCATE=: '(/:)=:'

NB. name obfuscation limit - higher values less likely to clash

OBFUSCNT=: 100000

NB. obfuscation local identifier prefix

OBFUSCPFX=: 'o_'

OK0250=: ' documented in ->'

OK0251=: 'edit locale cleared'

OK0252=: 'edit locale ->'

OK0255=: 'starting PDF reader'

OK0256=: 'jod.pdf not installed - use JAL to install the addon general/joddocument'

NB. PDF document indicator

PDF=: 'PDF'

NB. PDF reader - must accept command line argument

PDFREADER=: 'C:\Program Files\Adobe\Reader 8.0\Reader\acrord32.exe'

NB. on Mac's use the OS open command for PDFs

PDFREADERMAC=: 'open'

NB. character used to mark scriptdoc headers - currently a ''*

SCRIPTDOCCHAR=: '*'

blkaft=: 3 : 0

*NB.*blkaft v-- appends necessary blanks to J tokens.*

NB.

NB. This verb appends some necessary blanks to J tokens so that

NB. raising a token list and reparsing produces the same token

NB. list. A few unnecessary blanks may be inserted.

NB.

```
NB. monad: blkft blcl
NB.
NB. NB. line of J code
NB. line=. 'c=. +./\"1 c > ~:/\"1 y. e. ''''''''
NB. tokens=. ;: line
NB.
NB. NB. compare
NB. (;: ; tokens) -: tokens
NB. (;: ; blkft tokens) -: tokens

NB. assume no blanks are required
r=. 0 #~ # y
t=. y

while.do.
  u=. ;: ;\ t
  v=. ~.&.> ( <"1 |: u) -. L: 1 a:
  r=. r +. y e. ; {.&.> (1 < #&> v)#v

  if. y -: {: u do.
    NB. last tokenized row matches original
    break.
  else.
    NB. insert required blanks and reparse
    t=. ((r#t),&.>' ') (I. r)} t
  end.
```


end.

NB. insert required blanks and raise tokens

```
; ((r#y),&.>' ') (I. r)} y
)
```

changetok=: 4 : 0

*NB.*changetok v-- replaces J name tokens within a string. See*

NB. long documentation.

NB.

NB. dyad: clChanged =. clTokens changetok clStr

NB.

NB. '/boo/hoo' changetok 'boo boo boohoo boohoo'

```
if. #pairs=. 2 {.(1) _2 [\ <; _1 x do.
```

```
  pairs=. pairs #~ _2 ~: (4!:0) {."1 pairs NB. eliminate non-token pairs
```

```
end.
```

```
cnt=._1 [ lim=. # pairs
```

```
while. lim > cnt=. >:cnt do.
```

NB. process each change pair

```
  't c'=. cnt { pairs
```

NB. /target/change ()=. t c*

```
  if. +./b=. t E. y do.
```

NB. next if no targets

```
    w=. I. b
```

NB. target starts

```
    'l o'=. #&> cnt { pairs
```

NB. lengths ()=. l o*

```
    q=. (w { ' ' , y) e. NAMEALPHA
```

NB. head chars

```
    r=. ((w + 1) { y , ' ') e. NAMEALPHA
```

NB. tail chars

```
    w=. w #~ -. q +. r
```

NB. eliminate embedded tokens

```
    if. 0 = #w do. continue. end.
```

NB. next if no targets

```

b=. 1 w} 0 #~ # b          NB. reset target mask
p=. w + 0,+/\(<:# w)$ d =. o - 1  NB. change starts
s=. * d                    NB. reduce < and > to =
if. s = _1 do.
  b=. 1 #~ # b
  b=. ((1 * # w)$ 1 0 #~ o,l-o) (,w +/ i. l)} b
  y=. b # y
  if. o = 0 do. continue. end.  NB. next for deletions
elseif. s = 1 do.
  y=. y #~ >: d w} b          NB. first target char replicated
end.
y=. (c $~ o *# w) (,p +/i. o)} y  NB. insert replacements
end.
end. y                      NB. altered string
)

```

```
compclut=: 3 : 0
```

*NB.*compclut v-- removes comments and reduces multiple blank
NB. lines to singles.*

NB.

*NB. This verb removes all comments from J code and reduces
NB. multiple blank lines to one. All leading whitespace is
NB. preserved. This representation is surprisingly useful when
NB. debugging and reading code as it removes annoying "literary
NB. artifacts" while preserving the structure of code.*

NB.

NB. monad: cl =. compclut ctJcr

```
NB.
NB.  complut jcr 'compclut'

t=. 0 decomm y
LF ,~ ctl t #~ (-.b) +. firststone b=. */"1 ' '=t
)

compj=: 3 : 0

NB.*compj v-- compresses nonnouns by removing white space and
NB. shortening local identifiers.
NB.
NB. (compj) does not shorten global identifiers, object or locale
NB. names and implicit local (for.) names. The names changed by
NB. (compj) are labeled local by (11 globs).
NB.
NB. WARNING: code compression requires that all ambiguous names in
NB. J code are properly declared using (globs) scope tags. If
NB. such names are not properly identified compression will break
NB. your code.
NB.
NB. monad: cl =. compj blclNames
NB.
NB.  compj ;:'the byte diet'
NB.
NB. dyad: cl =. iaOption compj blclNames
NB.
NB.  1 compj ;:'remove comments preserving leading whitespace'
```

```
0 compj y
:
if. badil x do. jderr ERR001 return. end.

NB. get word definitions
if. badrc dat=. (WORD,NVTABLE) get y do. dat return. else. dat=. rv dat end.

NB. mask of non-nouns
b=. 0 < ; 1 {"1 dat

NB. set compression
cv=. compressj`compclut @. (1 -: x)

NB. compress non-nouns - remove any embedded tabs
dat=. (cv@:ctit&.> (b#{"1 dat) -.&.> TAB) (<(I. b);2)} dat

NB. generate packed script
(WORD,1) wtttext__MK dat
)

compressj=: 3 : 0

NB.*compressj v-- removes all white space from J words and
NB. shortens local names. This process reduces the readability of
NB. code and should only be applied to production code.
NB.
NB. monad: cl =. compressj ct
```

```
NB.
NB.   compressj jcr 'verbname'
NB.
NB.   NB. call in object context
NB.   compressj__UT__JODobj jcr_ajod_ 'compressj_base_'

NB. check for presence of white space only removal tag
w=. 1 e. CWSONLY E. ,y

NB. always remove white space
u=. dewhitejcr y
if. w do. u return. end.

NB. do not compress identifiers in code that cannot be
NB. reliably classified by the namecats verb.

NB. BUG: j 8.05 win64 can lose y shapes - sy$,y recovers y's shape

if. badrc m=. 1 namecats__MK y do. u return. end.
d=. ~. ;(<2 3 4;1){m=. rv m

NB. check for presence of obfuscation tag
if. o=. 1 e. OBFUSCATE E. ,y do.
  NB. local names less J arguments
  l=. ;(<1;1){m
  l=. l -. JARGS__MK
else.
```

```

    NB. local names less any single char names
    l=. ;(<1;1){m
    s=. l #~ 1 = #&> 1
    l=. l -. s
end.

NB. remove object references
l=. l -. exobrefs l,;(<0;1){m

NB. local names less any declared and for. names
if. 0=#m=. l -. d do. u return. end.

NB. remove any names with embedded locale references
if. 0=#m=. m #~ -. islocref&> m do. u return. end.

if. o do.
    NB. form obfuscated name replacements - drop trailing _ in (NAMEALPHA)
    bnr=. (<:#NAMEALPHA)&#.@(({:#NAMEALPHA)&i.)^:_1
    r=. ' ' -.~ , '/' , "1 (>m) , "1 '/' , "1 OBFUSCPFX , "1 bnr (#m)?OBFUSCCNT
else.
    NB. form replacements from any remaining chars !(*)=. SHORTNAMES
    NB. J arguments m n x y u v are not on SHORTNAMES
    if. 0=#r=. SHORTNAMES -. ,&.> s do. u return. end.
    if. (#r) < #m do.
        NB. we have more replacements than available SHORTNAMES
        NB. form base (#r) numbers using SHORTNAMES digits
        bnr=. (#r)&#.@((;r)&i.)^:_1

```

```
    r=. r,<"1(#r) }. bnr i. #m
end.
r=. ; '/' ,&.> m ,. (#m) {. r
end.

NB. replace tokens
r changetok u
)

createut=: 3 : 0

NB.*createut v-- initializes utility objects.
NB.
NB. monad: createut blObrefs
NB.
NB.    createut__UT JOD;ST;MK;UT;<SO

NB. object references !(*)=. JOD ST MK UT SO
'JOD ST MK UT SO'=: y

NB. set shortnames !(*)=. SHORTNAMES
SHORTNAMES=: ,&.> <"0 [ 52 {. NAMEALPHA
SHORTNAMES=: SHORTNAMES -. ;:'m n x y u v'

NB. add to overall jod interface
IZJODALL__JOD=: IZJODALL__JOD,IzJODutinterface

NB. define direct (ijod) locale interface for utilities
```

```
".&.> UT defzface IzJODutinterface
)
```

```
NB. convert LF delimited character lists to character tables
ctit=: [: ];._2 ] , (10{a.)"_
```

```
NB. display JOD result without return code
de=: list@:}.
```

```
dewwhitejcr=: 3 : 0
```

```
NB.*dewwhitejcr v-- removes all redundant blanks from J code.
NB. Result is a character list in linear representation format.
```

```
NB.
```

```
NB. monad: cl =. dewwhitejcr ct
```

```
NB.
```

```
NB. dewwhitejcr jcr 'anyword'
```

```
tt=. ;:&.> <"1 (ljust@:decomm) y NB. list of tokenized lines
; (blkft&.> tt) ,&.> LF NB. insert blanks, LF's and raise
)
```

```
dewwhitejscrip=: 3 : 0
```

```
NB.*dewwhitejscrip v-- removes all redundant blanks from J
NB. scripts.
```

```
NB.
```



```
NB. monad: dewhitejscript cl
NB.
NB.   dewhitejscript read 'c:\any\j\script.ijs'

NB. replace any tabs with single blanks
y=. ' ' (I. y=TAB)} y

NB. remove blank lines and all comments from script
y=. ;:&.> <"1 decomm ];. _1 LF,y-.CR

NB. remove redundant blanks in code
; (blkaft&.> y) ,&.> <CRLF
)

disp=: 3 : 0

NB.*disp v-- display dictionary objects as text. This verb
NB. returns a character list instead of a the usual (rc;values
NB. ...) boxed list.
NB.
NB. monad: disp cl/blcl
NB. dyad: iaObject disp cl/blcl

0 disp y
:
if. badrc uv=. x obtext y do. uv else. >{:uv end.
)
```

```
doc=: 3 : 0
```

```
NB.*doc v-- formats document text using the conventions of the
NB. (docct) verb.
NB.
NB. monad: doc clName
NB.
NB. doc 'word' NB. format leading block of explicit defn comments
NB.
NB. dyad: iaObject doc clName
NB.
NB. 1 doc 'test' NB. format test document text
NB. 0 9 doc 'longdoc' NB. format long word documentation text
```

```
docword y
:
x doctext y
)
```

```
docct2=: 4 : 0
```

```
NB.*docct2 v-- formats leading comments.
NB.
NB. This verb formats the leading comments in a character table.
NB. There are three basic types of tables: (1) character
NB. representations of explicit words with leading contiguous
NB. comment blocks, (2) general J scripts with leading contiguous
NB. comment blocks, (3) long JOD documentation text without
```

```
NB. leading comments (no 'NB.'s). Long documentation follows the
NB. same formatting conventions without the leading 'NB.'s
NB.
NB. Result is a character table.
NB.
NB. dyad:  ctFormatted =. (iaWidth;iaStarPos;iaBlockIdx;clPfx) docct2 ctText
NB.
NB.    (41;0;1;'NB.') docct2__UT__JODobj ];._1 LF,disp 'docct2'           NB.(1)
NB.    (40;0;0;'NB.') docct2__UT__JODobj ];._1 LF,(4 disp 'scriptstub')-.CR NB.(2)
NB.    (57;0;0;'') docct2__UT__JODobj ];._1 LF,(4 disp 'docstub')-.CR   NB.(3)

NB. width, star-row, block-index, prefix
'wid star blidx pfx'=. x
plen=. #pfx

NB. get any first block of comments
if. plen do.
  if. -. +./b1=. +./"1 (,: pfx) E. y do. y return. end.
  txt=. ((firstone b1) +. firstone -.b1) <;.1 y
else.
  NB. the prefix is null - the first comment block is all text
  txt=. <y
end.

if. blidx >: #txt do. y return. else. blk=. > blidx { txt end.
if. +./ (star,plen) >: $blk do. y return. end.
```

NB. apply formatting only to scriptdoc'ed text
 if. SCRIPTDOCCHAR=(<star;plen){blk do.

NB. clear scriptdoc mark remove any prefixes
 blk=. ' ' (<star;plen)} blk
 if. plen do. blk=. (#pfx) }."1 ljust blk end.

NB. format comments remark for scriptdoc
 'head tail'=. (wid;DOCUMENTMARKS) docfmt2 blk
 head=. SCRIPTDOCCHAR (<star;plen)} (pfx,' ') ,"1 head
 tail=. pfx ,"1 tail

NB. return formatted text
 ; (<head,tail) (blidx)} txt
 else.
 y
 end.
)

docfmt2=: 4 : 0

*NB.*docfmt2 v-- formats comment region.*

NB.

NB. dyad: (iaWid ; blclMarks) docfmt2 ct

NB.

NB. (67;MONADMARK;DYADMARK) docfmt2 5#,: 'to comment or not to comment'

NB. text width and n marks

```
width=. >{. x
marks=. }. x
```

NB. leave all text following any marks alone

```
b=. +./"1 +./ (, :&.> marks) E.&> <y
b=. 1 (0)} firstone +./\ b
'head tail' =. 2 {. (b <;.1 y),<i.0 0
```

NB. format paragraphs of head

```
head=. ljust head
head=. width textform2&.> (1(0)}*./"1' '=head)<;.1 head
```

NB. remove null paragraphs, remerge and mark for scriptdoc

```
head=. (0 < #&> head)#head
head=. (-0=#tail) }. ;head,&.> ' '
```

NB. return formatted text and unformatted tail

```
head;tail
)
```

```
doctext=: 4 : 0
```

*NB.*doctext v-- formats long document, object and header text.*

NB.

NB. dyad: iaObject doctext clName

NB.

NB. 0 doctext 'word'

NB. 1 doctext 'test'

```

if. badcl y do. jderr ERR001  NB. errmsg: invalid options
elseif. badrc uv=. checkput__ST y  do. uv
elseif. badrc uv=. checknames__ST y do. uv
elseif. ((1=#x) *. ({.x) e. TEST,MACRO) +. x e. (GROUP,SUITE) ,. 1  do.
    if. badrc uv=. x obtext y do. uv return. else. uv=. >{:uv end.
    NB. format leading comments of test, macro and group/suite header scripts
    DL={: {.DPATH__ST
    uv=. ctl (DOCUMENTWIDTH__DL;0;0;'NB.') docct2 ];. _1 LF,uv-.CR
    if. x-:MACRO do.
        NB. format only J script macros
        if. badrc uv2=. (MACRO,INCLASS) get y do. uv2 return. end.
        NB. errmsg: macro is not a J script - not formatted
        if. JSCRIPT=>{:uv2 do. x put y;JSCRIPT;uv else. jderr ERR0261 end.
    else.
        x put y;uv
    end.
elseif. -. (<x) e. {OBJECTNC;DOCUMENT do. jderr ERR001
elseif. y=. }. uv
    DL={: {.DPATH__ST
    badrc uv=. ((x={.x);<DL) inputdict__ST y do. uv
elseif. badrc uv=. x getdocument__ST y do. uv
elseif.do.
    NB. document text using same formatting
    NB. conventions applied to words.
    uv=. (1;0 1){:: uv
    uv=. ];. _2 (uv -. CR),LF

```

```

uv=. ctl ; (DOCUMENTWIDTH__DL;DOCUMENTMARKS) docfmt2 uv
(x,DOCUMENT) put y,<uv
end.
)

```

```
docword=: 3 : 0
```

*NB.*docword v-- formats the leading comment block in dictionary
 NB. verbs, adverbs and conjunctions. Nouns do not have internal
 NB. documentation. Attempts to document a noun results in an
 NB. error.*

NB.

*NB. Note: nouns do have external documentation in the form of
 NB. short explanations and supplemental document text. See (put)
 NB. and (get).*

NB.

NB. monad: docword clName

```

if. badcl y do. jderr ERR001
elseif. badrc uv=. checkput__ST y do. uv
elseif. badrc uv=. checknames__ST y do. uv
elseif. y=. }. uv
    DL=.{: {.DPATH__ST
    badrc uv=. (WORD;<DL) inputdict__ST y do. uv
elseif. badrc uv=. (WORD,0) getobjects__ST y do. uv
elseif. 0 = (1;0 1){:: uv do.
    NB. errmsg: is a noun no internal document
    jderr '<','(' ' ' -.> ,>y), '>' , ERR0250

```

```

elseif. cr=. (1;0 2){:: uv
    cr=. (-LF = {:cr) }. cr,LF
    NB. cr=. ctl DOCUMENTWIDTH_DL docct ];._2 cr NB. OLDPCODE
    cr=. ctl (DOCUMENTWIDTH_DL;0;1;'NB.') docct2 ];._2 cr
    uv=. , 1 {:: uv
    uv=. (<cr) 2} uv
    badrc msg=. (WORD,NVTABLE) put uv do. msg
elseif.do.
    (ok '<',(>{.uv),'>',OK0250),{:msg
end.
)

ed=: 3 : 0

NB.*ed v-- edit dictionary objects.
NB.
NB. (ed) typically fetches, formats and places object(s) in an edit window.
NB.
NB. monad:  ed cl/blcl/bt
NB.
NB.    ed 'wordname'
NB.
NB.    ed ;:'many words mashed into one edit script'
NB.
NB.    NB. edit contents of (name,value) and (name,class,value) tables
NB.    ed ; }. 0 10 get }. dnl 're'
NB.    ed ; }. 4 get }. 4 dnl 'build'
NB.

```



```

NB. NB. place many backup versions in edit window
NB. ed ; }. bget <;._1 ' word.12 word.11 word.09 word.02'
NB. ed ; }. 4 bget <;._1 'macro.9 macro.7 macro.2'
NB.
NB. dyad: iaObject/ilObjOpt ed cl/blcl
NB.
NB. 1 ed 'testname' NB. edit test
NB. 0 9 ed 'worddocument' NB. document text associated with word
NB. 2 ed 'group' NB. generate entire group script and edit
NB. 2 1 ed 'grouptext' NB. edit only group text

```

```

0 ed y
:
if. 2=#$ y do.
  if. badrc uv=. checknttab3 y do. uv return.
elseif. 3 = {:$ uv=. rv uv do.
  if. 3 >: <./ jc=. ;1{"1 uv do.
    NB. convert binary nouns to linear representations
    jc=. I. 0=jc
    if. badrc nv=. 0 nounlrep__MK jc{uv do. nv return. end.
    uv=. (rv nv) jc} uv
    NB. format words for editing
    text=. _2 }. ; (0 {"1 uv) ,. (<'=:') ,. (2 {"1 uv) ,. <2#LF
  else.
    NB. format non words for editing
    text=. _2 }. ; ({:"1 uv) ,&.> <2#LF
  end.
end.

```

```

elseif.do.
  NB. format non words for editing
  text=. _2 }. ; ({:"1 uv) ,&.> <2#LF
end.
NB. set default object name - if there is more than one
NB. object reset (x) to prevent affixing document command
oname=. ;0{0{uv [ x=. 1 < #uv
elseif. badrc uv=. x obtext y do. uv return.
elseif.do.
  'oname text'=. }.uv
end.

NB. append user defined document command
NB. the pattern {~N~} is a name placeholder, e.g.
NB. DOCUMENTCOMMAND_iod_ =: 'showpass pr '{~N~}''
NB. append only when editing single words
if. (x -: 0) *. wex <'DOCUMENTCOMMAND_iod_' do.
  text=. text,LF,LF,('/{~N~}/',oname) changestr DOCUMENTCOMMAND_iod_
end.

oname et text
)

et=: 3 : 0

NB.*et v-- edit text
NB.
NB. monad: et clText

```

```
NB. dyad:  clFile et clText

EDTEMP et y  NB. default edit file
:
NB. write to J temp directory - created by J install
try.

(toHOST y) write file=. jpath '~temp/' , x , IJS

NB. open in various editors !(*)=. IFJ6 IFWIN IFJHS IFQT IFIOS IFGTK open
if. */ wex ;:'IFJ6 IFWIN' do.
  if. IFJ6 * IFWIN do. smopen_jijs_ file return. end. NB. J 6.0x win systems
end.

if. IFQT do. open file  NB. jqt ide

NB. JHS on macs - not tested recently
NB. elseif. IFJHS *. wex <'wwd_qjide_' do. 0 0$(1!:2&2) '$$$edit$$$','file  NB. qjide

NB. JHS on win
elseif. IFJHS do. edit_jhs_ file

NB. running in jconsole on Windows systems
NB. WARNING: there is no indication of fork failures
NB. testing the existence of (EDCONSOLE) and the alleged
NB. (file) for every edit operation would slow down normal use
elseif. IFWIN *. IFJHS +: IFQT do. fork_jtask_ EDCONSOLE,' ',file
```

NB. remaining editors are marginal, deprecated or rarely used with JOD

NB. iPhone/iPad

```
elseif. IFIOS do. je_z_ file
```

NB. GTK systems are deprecated

```
elseif. wex <'IFGTK' do.
```

```
  if. IFGTK do. open_jgtk_ file  else. jderr ERR0255 end. NB. GTK
```

```
elseif.do. jderr ERR0262 NB. errmsg: not supported on current J system
end.
```

```
catch. jderr ERR0255 NB. errmsg: unable to open TEMP/*.ijs for editing
end.
)
```

NB. extract object references from blcl of names

```
exobrefs=: a:"_ -.~ [: ~. [: ; [: <;_1&.> ([: +./\&.> (<'__')"_ E.&.> ]) #&.> ]
```

```
gt=: 3 : 0
```

*NB.*gt v-- get J script text from J temp directory.*

NB.

NB. monad: gt cl/zl

NB.

NB. gt '' NB. read text in 99 file

```
NB.    gt 'whatever'

if. isempty y do. y='.99' end.
NB. use J temporary edit directory
NB. (jpath) is a J system utility loaded by standard profile
try.  read jpath '~temp\' ,y , IJS
catch. jderr ERR0254
end.
)

NB. formats (jodhelp) command line and spawns browser or pdfreader
jodfork=: [: fork_jtask_ [: ; 1 0 2 { ' ' ; qt

jodhelp=: 3 : 0

NB.*jodhelp v-- display JOD help.
NB.
NB. monad:  jodhelp uuIgnore
NB.
NB.    jodhelp '' NB. display JOD help - start PDF browsing

jodpdf=. jpath '~addons\general\joddocument\pdfdoc\jod.pdf'
if. fex<jodpdf do.
  NB. jod.pdf is installed and local
  pdfldr=. pdfreader 0
  if. UNAME-:'Darwin' do.
    NB. require 'task' !(*)=. shell
```

```

    ok OK0255 [ shell pdfdrdr,' ',qt jodpdf NB. msg starting PDF reader
elseif. fex<pdfdrdr do.
    NB. spawn PDF browse task - requires configured PDF reader on host
    ok OK0255 [ jodfork pdfdrdr;jodpdf
elseif.do.
    (jderr ERR0260),<pdfdrdr NB. errmsg: PDF reader not found
end.
else.
    NB. jod.pdf is not installed advise user to download joddocument addon
    ok OK0256 NB. msg: jod.pdf not installed - use JAL to install the addon general/joddocument
end.
)

NB. left justify table
ljust=: ' '&$: :([] |."_1~ i."1&0@([] e. [])

obtext=: 4 : 0

NB.*obtext v-- assembles and returns object text
NB.
NB. dyad: bt =. iaObject obtext blcl

if. badrc text=. checkopen__ST y do. text return. end.
select. x
case. WORD do.
    if. badrc y=. checknames__ST y do. y return. else. y=. }.y end.
    if. badrc text=. (WORD,NVTABLE) get y do. text return. end.

```

```
if. badrc text=. WORD wtext__MK rv text do. text return. else. text=. rv text end.
file=. >{.y
case. DICTIONARY do.
  if. badrc text=. DICTIONARY get '' do. text return. else. text=. rv text end.
  file=. (' ' -.~ ;0{0{DPATH__ST__JODobj),'_DTEXT' NB. HARDCODE document text suffix
case. SUITE;GROUP do.
  if. badrc text=. (x,2) make y do. text return. else. text=. rv text end.
  file=. y -. ' '
case. TEST;MACRO do.
  if. badrc y=. checknames__ST y do. y return. else. y=. }.y end.
  if. badrc text=. x get y do. text return. end.
  if. badrc text=. x wtext__MK rv text do. text return. else. text=. rv text end.
  file=. >{.y
case.do.
  if. (<x) e. {(SUITE,GROUP);HEADER do.
    NB. group and suite headers are frequently edited
    if. badcl y do. jderr ERR0154__MK return. end.
    if. badrc uv=. ({.x) get y do. uv return. else. 'file text'=. , rv uv end.
  elseif. (<x) e. ,{OBJECTNC;DOCUMENT,EXPLAIN do.
    NB. get object documentation text
    if. badrc uv=. x get y do. uv return.
  else.
    NB. merge all document texts
    file=. >{.{. uv=. rv uv
    text=. ; ({:"1 uv) ,&.> <2#LF NB. HARDCODE 2
  end.
elseif.do.
```

```
    jderr ERR001 return. NB. errmsg: invalid option(s)
end.
end.
ok file;text
)

pdfreader=: 3 : 0

NB.*pdfreader v-- returns a pdf reader from available options.
NB.
NB. monad: clPDFExe =. pdfreader uuIgnore

NB. prefer J's pdf readers otherwise take JOD reader !(*)=. PDFREADER
if. wex<'PDFREADER__UT__JODobj' do. pdfldr=. PDFREADER__UT__JODobj else. pdfldr=. '' end.

NB. on Mac's use the open command for PDF's
if.    UNAME-:'Darwin'    do. pdfldr=. PDFREADERMAC
elseif. wex<'PDFReader_j_' do. if. 0<#PDFReader_j_ do. pdfldr=. PDFReader_j_ end. NB. J 7.0x
elseif. wex<'PDFREADER_j_' do. if. 0<#PDFREADER_j_ do. pdfldr=. PDFREADER_j_ end. NB. J 6.0x
end.

pdfldr
)

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
)

revo=: 3 : 0

NB.*revo v-- recently revised objects. Lists recently changed put
NB. dictionary objects in order of latest to oldest.
NB.
NB. monad:  revo zl / cl
NB.
NB.   revo ''      NB. all put dictionary words in revision order
NB.   revo 'pat'   NB. recently changed words beginning with 'pat'
NB.
NB. dyad:  iaObject revo zl / cl
NB.
NB.   1 revo ''    NB. all revised tests
NB.   2 revo 'g'   NB. recently changed groups beginning with 'g'

WORD revo y NB. word default
:
```

```

if. badil x do. jderr ERR001
elseif. badrc uv=. ((x={.x}),_1) dnl y do. uv  NB. HARDCODE _1
elseif. isempty new=.rv uv do. ok new  NB. no matches
elseif.do.
    age=. rv (x,INPUT) get new  NB. last put timestamps
    ok (\: age) { new
end.
)

rm=: 3 : 0

NB.*rm v-- runs J macro scripts
NB.
NB. monad:  rm cl/blcl
NB. dyad:   pa rm cl/blcl

NB. (/:)=: obfuscate names
0 rm y
:
if. badrc uv=. MACRO get y do. uv return. end.
uv=. rv uv

if. */um=. JSCRIPT = ; 1 {"1 uv do.

    scr=. ;({:"1 uv) ,&.> LF
    curr=. 18!:5 ''

    try.

```

```

    NB. j profile !(*)=. cocurrent
    NB. run from base, (display default, suppress x.-:1) stop on errors
    cocurrent 'base'
    if. x-:1 do. 0!:100 scr else. 0!:101 scr end.
    cocurrent curr
catchd.
    cocurrent curr NB. restore locale
    (jderr ERR0256),<13!:12 '' return.
end.

else.
    NB. errmsg: not J script(s)
    (jderr ERR0252),(-.um)#{"1 uv
end.
)

rtt=: 3 : 0

NB.*rtt v-- runs J test scripts
NB.
NB. monad: rtt cl/blcl
NB.
NB.   rtt 'runmytautology'
NB.   rtt ;: 'run these tautology tests in order'
NB.
NB. dyad:
NB.
NB.   0 rtt 'tautology'

```

```
NB. 1 rtt 'silenttautology'
NB. 2 rtt 'plaintest'
NB. 3 rtt 'suite'    NB. make and run tautology test suite
NB. 4 rtt 'suite'    NB. make suite and run silently

0 rtt y
:

NB. HARDCODE: option codes (/:)=: obfuscate names
if. (3-:x) +. 4-:x do.
  if. badrc uv=. (SUITE,_2) make y do. uv return. end.
  scr=.rv uv
  x=. x-3 NB. run option
else.
  if. badrc uv=. TEST get y do. uv return. end.
  uv=. rv uv
  scr=. ;({:"1 uv) ,&.> LF
end.

curr=. 18!:5 ''

NB. j profile !(*)=. cocurrent
NB. run from base, (display default, suppress x-:1), stop on errors
cocurrent 'base'
try.
  if. 0-:x      do. 0!:2 scr
    NB. Note: silent execution that fails suppresses all output
```

```

elseif. 1-:x do. (] [ 1!:2&2) 0!:3 scr
elseif. 2-:x do. 0!:001 scr
elseif.do.
    cocurrent curr
    jderr ERR001 return.
end.
catchd.
    cocurrent curr
    (jderr ERR0256),<13!:12 '' return.
end.

```

NB. back to original locale
cocurrent curr
)

```
textform2=: 63&$: :(4 : 0)
```

*NB.*textform2 v-- wraps and justifies character table (y).*

NB.

*NB. This verb forms an (n*len) character matrix. The blanks in
NB. each row of the output matrix are padded so that the line is
NB. right and left justified. The number of rows in the output
NB. table depends upon how many are needed to hold the input data
NB. in the justified format.*

NB.

*NB. Note: This verb is a verbatim translation of an APL utility
NB. and has not been optimized for J.*

NB.

```

NB. monad: cmWrap =. textform2 c[0..2]Text
NB.
NB.    textform2 1000$' How can I justify this eh. '
NB.
NB. dyad: cmWrap =. iaWidth textform2 c[0..2]Text
NB.
NB.    50 textform2 10#,: ' four score and seven years ago our '

```

```

i=. 0
v=. reb , y , "1 ' '
j=. #v
b=. j$0
while. j > a=. i + x do.
  k=. i + i. >:a - i
  if. #c=. (' ' = k{v)#k do.
    i=. >: {: c
    g=. ({:k) - <:i
    c=. (1 >. <:#c) {. c
    f=. #c
    d=. f $ <. g%f
    d=. (>:{.d) (i. f|g)} d
    b=. d ((f?f){c)} b
  else.
    b=. 1 a} b
    i=. a
  end.
end.
end.

```

```
v=. (>b) # v
e=. >: x
r=. >.(#v) % e
(r,x) {. (r,e)$ (e*r){.v
)
```

jodtools Source Code

*NB.*jodtools c-- derived tools class: extension of (jodutil).*
NB.
NB. Interface words:
NB. addgrp add words/tests to group/suite
NB. allnames combines names from (refnames) and (obnames)
NB. allrefs all names referenced by objects on name list
NB. delgrp remove words/tests from groups/suites
NB. getrx get required to execute
NB. hlpnl displays short descriptions of objects on (y)
NB. jodage days since last change and creation of JOD objects
NB. jodhelp display online JOD help
NB. lg make and load JOD group
NB. mls make load script
NB. noexp returns a list of objects with no explanations
NB. notgrp words or tests from (y) that are not in groups or suites
NB. nt gets name and text from edit windows
NB. nw edit a new explicit word using JOD conventions
NB. obnames unique sorted object and locale names from (uses) result
NB. pr put and cross reference a word - very handy as an editor DOCUMENTCOMMAND
NB. refnames unique sorted reference names from (uses) result
NB. revonex returns a list of put dictionary objects with no explanations
NB. swex set short word explanation from (doc) header
NB. usedby returns a list of words from (y) that DIRECTLY call words on (x)
NB.
NB. Notes:

NB. Error messages (jodtools range 00400-001000)

(9!:41) 0 *NB. discard whitespace*

```
coclass 'ajodtools'  
coinsert 'ajodutil'
```

*NB.*end-header*

NB. jodage header text

```
AGEHEADER=: <;._1 '|Name|Date First put|Days from First put|Date Last put|Days from Last put|'
```

NB. carriage return character

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

NB. nw edit text template

```
DOCUMENTMARK=: 123 126 78 126 125 61 58 32 123 126 67 126 125 32 58 32 48 10 10 78 66 46 42 123 126 78 126  
>..>125 32 123 126 84 126 125 45 45 32 119 111 114 100 116 101 120 116 10 78 66 46 10 78 66 46 32 109 111 110  
>..>97 100 58 32 32 123 126 78 126 125 32 63 63 10 78 66 46 32 100 121 97 100 58 32 32 63 63 32 123 126 78 126  
>..> 125 32 63 63 10 10 39 78 73 77 80 32 123 126 78 126 125 39 10 41{a.
```

```
ERR00400=: 'load script is not unique - edit startup.ijs ->'
```

```
ERR00401=: 'tag error in startup.ijs file ->'
```

```
ERR00402=: 'cannot write/create startup.ijs file ->'
```

ERR00403=: 'invalid make load script option (0 or 1)'

ERR00404=: 'J script error in group ->'

ERR00405=: 'words refer to objects/locales ->'

ERR00406=: 'invalid delimiter'

ERR00407=: 'ROOTFOLDER must be a character list configured (jpath) expression like: ~user/jodroot'

ERR00408=: 'unable to write load script ->'

NB. locgrp Group Suite display text

GROUPSUITES=: <._1 ' Groups Suites'

NB. JODTOOLS interface - loaded into (ijod) - see (setjodinterface)

IzJODtools=: <._1 ' addgrp allnames allrefs delgrp fsen getrx hlpnl jodage lg locgrp ltx mls noexp notgrp
>..> nt nw obnames pr refnames revonex swex usedby'

NB. comment tag marking end of scripts

JODLOADEND=: 'NB.</JOD_Load_Scripts>'

NB. comment tag marking start of scripts

JODLOADSTART=: 'NB.<JOD_Load_Scripts>'

NB. JODTOOLS version, make and date

JODTOOLSVMDB=: '1.0.1';7;'28 Mar 2020 13:01:05'

NB. line feed character

LF=: 10{a.

OK00400=: 'load script saved ->'

OK00401=: 'file saved ->'

OK00402=: ' added to ->'

OK00403=: ' deleted from ->'

OK00404=: ' group loaded'

OK00405=: ' group loaded with postprocessor'

OK00406=: ') words loaded into -> '

NB. postprocessor prefix

POSTAMBLEPFX=: 'POST_'

NB. name of test used as a template

TESTSTUB=: 'teststub'

```
WARNING00400=: 'NB. WARNING: JOD managed section do not edit!'
```

```
NB. words tests display text
```

```
WORDTESTS=: <;._1 ' words tests'
```

```
addgrp=: 4 : 0
```

```
NB.*addgrp v-- add words/tests to group/suite.
```

```
NB.
```

```
NB. monad: clGroup addgrp blclNames
```

```
NB. (clGroupSuite;iaObject) addgrp blclNames
```

```
NB.
```

```
NB. 'jodhlp' addgrp ;:'addgrp delgrp'
```

```
NB. ('testsuite';3) addgrp ;:'test and moretests'
```

```
'group code'=. 2{.(boxopen x),<2
```

```
uv0=. code grp group
```

```
if. 0=>{.uv0 do. uv0
```

```
elseif. 1=>{.uv0=.code grp (group;}.uv0),y=.boxopen y do.
```

```
  gtyp=.,>(code=2 3)#WORDTESTS
```

```
  ok (":#y), ' ',gtyp,OK00402);group NB. okmsg: added to
```

```
elseif.do. uv0
```

```
end.
```

```
)
```

```
addloadscript=: 4 : 0
```

*NB.*addloadscript v-- inserts (mls) generated scripts into
NB. startup.ijs.*

NB.

NB. Changed: 08jun12 this verb was modifying the scripts.ijs file

NB. in the J system tree. This file is now frequently updated by

NB. JAL so startup.ijs is now modified.

NB.

NB. Changed: 11feb02 j 7.01 introduced Public_j_ in place of

NB. PUBLIC_j_ modified to use new noun. Path separation

NB. characters also standardized.

NB.

NB. dyad: baPublic addloadscript (clGroup ; clPathGroup)

NB. standardize path separation character

y =. jpathsep&.> y

if. 1=x do.

NB. get startup.ijs

NB. J path utility !()=. jpath*

tags=. JODLOADSTART;JODLOADEND

if. fex<cfg=. jpath '~config/startup.ijs' do.

scripts=. read cfg

'p c'=. tags betweenidx scripts

else.

NB. no startup.ijs

p=. scripts=. ''

```

end.

if. 1=#p do.
  if. badrc ld=. (;p{c) addloadscript1 y do. ld return. else. ld=>1{ld end.
  NB. insure 'buildpublic' text starts with an LF
  mlscfg=. toHOST ;(<(LF }~ LF-:{.ld),ld) p} c
elseif. 0=#p do.
  NB. no JOD load scripts append current
  ld=. (0{tags),(<LF,'buildpublic_j_ 0 : 0',LF),(0{y),(<' '), (1{y),(<LF,')',LF),1{tags
  mlscfg=. toHOST scripts , (2#LF), WARNING00400 , LF , ;ld
elseif.do.
  NB. errmsg: tag error in startup.ijs file
  (jderr ERR00401),<cfg return.
end.

NB. create/update startup.ijs
if. _1 -: mlscfg (write :: _1:) cfg do.
  NB. errmsg: cannot write/create startup.ijs file
  (jderr ERR00402),<cfg return.
end.

NB. directly update public script noun if present
y=. y ,&.> '' ;IJS
if. wex <'Public_j_' do. Public_j_=: Public_j_ updatepublic y NB. J 7.0x
elseif. wex <'PUBLIC_j_' do. PUBLIC_j_=: PUBLIC_j_ updatepublic y NB. J 6.0x
end.

```

```
    ok OK00400;1{y  NB. okmsg: load script saved
elseif. 0=x do.
    ok OK00401;(1{y) ,&.> <IJS NB. okmsg: file saved
elseif.do.
    NB. errmsg: invalid make load script option (0 or 1)
    jderr ERR00403
end.
)

addloadscript1=: 4 : 0

NB.*addloadscript1 v-- appends or replaces a script in the load script section of startup.ijs
NB.
NB. dyad:  clJODLoadScripts addloadscript1 (clGroup ; clPath)

NB. insure we have text
if. 0=#x do. ok x return. end.

NB. cut into lines
ldl=. <;._1 ((LF={.x}).LF),x -. CR

NB. search for group name - can occur at most once
NB. searches only group names ignoring path file text
msk=. (' '&beforestr &.> ldl) e. 0{y
if. 1 >: +/msk do.

    NB. load script name and path
    scr=. <;(<' ') (1)} 1 0 1 #^:_1 y
```

```

NB. add extension if missing
if. -.IJS -: ;(-#IJS) {.&.> scr do. scr=. scr ,&.> <IJS end.

NB. if name exists replace it else add it at end
if. +./msk do.
  ldl=. scr (I. msk)} ldl
else.
  NB. find ) and insert before
  msk=. 1 ,~ -. (ldl -.&.> ' ') e. <,')'
  ldl=. scr (I. -.msk)} msk #^:_1 ldl
end.

NB. return modified
ok }. ; LF ,&.> ldl
else.
  NB. errmsg: load script is not unique
  (jderr ERR00400),0{y
end.
)

NB. all names from uses: allnames 31 uses 'name'
allnames=: ~.@('___'&beforestr&.>@obnames , refnames)

NB. all nonlocale name references: allrefs ;:'return my references'
allrefs=: [: /:~ [: ~. ] , [: refnames 31&uses

```



```
betweenidx=: 4 : 0
```

```

NB.*betweenidx v-- indexed sublists between nonnested delimiters.
NB.
NB. Cuts up lists containing balanced nonnested start/end
NB. delimiters into boxed lists of indexed sublists.
NB.
NB. Note: this verb does a simple count for delimiter balance.
NB. This is a necessary but not sufficient condition for
NB. delimiter balance.
NB.
NB. dyad: (ilIdx ;< blcl) =. (clStart;clEnd) betweenidx cl
NB.      (ilIds ;< blnl) =. (nlStart;nlEnd) betweenidx nl
NB.
NB. ('start';'end') betweenidx 'start yada yada end boo hoo start ahh end'
NB.
NB. '{}' betweenidx 'go{ahead}{ }cut{me}{up}{ }'
NB.
NB. NB. also applies to numeric delimiters
NB. (1 1;2 2) betweenidx 1 1 66 666 2 2 7 87 1 1 0 2 2

```

```

if. #y do.
  's e'=. x          NB. start/end delimiters
  assert. -. s -: e  NB. they must differ
  em=. e E. y        NB. end mask
  sm=. (-#s) |.!0 s E. y  NB. start mask
  mc=. +/sm           NB. middle count

```

```

assert. mc=+/em          NB. delimiter balance
c=. (1 (0))} sm +. em) <|.1 y  NB. cut list

NB. insert any missing middles to insure all indexed
NB. sublists correspond to a location in the cut list
ex=. 1 #~ >: +: mc
ex=. (-. sm {.,.1 em) (>: +: i. mc)} ex
c=. ex #^:_1 c

((# i.@#) (#c)$0 1);<c      NB. prefix indexes
else.
  (i.0);<y                  NB. empty arg result
end.
)

createjodtools=: 3 : 0

NB.*createjodtools v-- initializes new jod tools object
NB.
NB. monad:  createjodtools blclObjects
NB.
NB.  JODtools_iod_=: conew 'ajodtools'      NB. new tools object
NB.  createjodtools__JODtools JODtools,JODobj  NB. pass self and tools

NB. use JOD object reference to locate extant subobjects
NB. Note: currently these object references are not used
NB. but are defined so that native JOD words can be accessed
NB. by words in JODtools instances in future additions to this class

```

```
NB. !(*)=. ST MK UT SO
self=.0{y [ jod=.1{y
ST=: ST__jod
MK=: MK__jod
UT=: UT__jod
SO=: SO__jod

NB. append object reference to list of JOD extensions
NB. adding to this list allows (destroyjod) to destroy
NB. all JOD extension objects with JOD core objects
JODEXT__jod=: JODEXT__jod,self

NB. add tool words to overall JOD (ijod) locale interface
NB. (*)=. IZJODALL JODEXT
IZJODALL__jod=: IZJODALL__jod,IzJODtools,<'JODtools'

NB. define direct (ijod) locale interface for tools - if the (ijod)
NB. trap word (jodsf) exists define an error trapping interface
(i.0 0)"_ ".&.> self defzfzface IzJODtools
)

dayage=: 3 : 0

NB.*dayage v-- age in days.
NB.
NB. monad: dayage iLYYYMMDD
NB.
NB. dayage 1953 7 2
```

```
NB.
NB. dyad:  pa dayage iaYYYYMMDD / iuYYYYMMDD
NB.
NB.    1 dayage 4 4$20000101 19500202 19000303
NB.    0 dayage 1986 8 14

0 dayage y
:
if. x do. n=. today~ 0 else. n=. today 0 end.
(x todayno n) - x todayno y
)

delgrp=: 4 : 0

NB.*delgrp v-- remove words/tests from groups/suites.
NB.
NB. monad:  clGroup delgrp blclNames
NB.          (clGroupSuite;iaObject) delgrp blclNames
NB.
NB.    'jodhlp' delgrp  ;:'addgrp delgrp'
NB.    ('testsuite';3) delgrp ;:'test and moretests'

'group code'=. 2{.(boxopen x),<2
uv0=. code grp group
if. 0=>{.uv0 do. uv0
elseif. 1=>{.uv0=.code grp group;}.uv0-.y=.boxopen y do.
  gtype=.,>(code=2 3)#WORDTESTS
  ok ((":#y),' ',gtype,OK00403);group NB. okmsg: deleted from
```

```

elseif.do. uv0
end.
)

firstcomment=: 3 : 0

NB.*firstcomment v-- extracts the first comment sentence from J words.
NB.
NB. monad: firstcomment cLinear
NB.
NB. firstcomment 5!:5 <'firstcomment'
NB. firstcomment disp 'jodword'
NB.
NB. NB. first comments from many JOD non-nouns
NB. n=. (}. grp 'JOD') -. 0 1 0 dnl''
NB. t=. 1 pick 0 8 get n
NB. n=. ({"1 t) #~ 0= #> {"1 t
NB. d=. 1 pick 0 10 get n
NB. c=. n ,. firstcomment&.> 2{"1 d

NB. char table of just comment text
comtext=: 3 }. "1 ljust onlycomments ] ;. _2 (y-.CR),LF

NB. drop text below any monad and dyad marks
mask=: +./"1 ((,:MONADMARK) E. comtext) +. (,:DYADMARK) E. comtext
comtext=: , ' ' ,. comtext #~ -. +./\ mask

NB. take the first comment to end with a '.'

```

NB. excluding any J argument strings, eg. x. y.

NB. NIMP may not hold in j 6.01

```
comtext=. reb comtext {~ firstperiod comtext
if. #comtext do.
```

NB. trim scriptdoc style headers if any

```
if. '*'={.,comtext do.
  alltrim '--' afterstr comtext
end.
```

```
end.
```

```
)
```

```
firstperiod=: 3 : 0
```

*NB.*firstperiod v-- returns the index of first sentence period.*

NB. J arguments m. n. x. y. u. v. are excluded.

NB.

NB. monad: firstperiod cl

NB.

NB. firstperiod 'not here {m. or here [u. or here (x.) or here u. but here. Got that'

NB. mask out J arguments in at most first 500 chars

```
y=. (500<.#y){.y
args=. ;&.> , { (<<"0' ([{''),<;:'m. n. x. y. u. v. *.'
y=. ' ' (I. _2 (|. !. 0) +./ args E.&> <y)} y
```

NB. first period after masking

```
y i. '.'  
)
```

```
NB. first document sentence  
fsen=: ] ; [: firstcomment disp
```

```
getrx=: 3 : 0
```

```
NB.*getrx v-- get required to execute. (getrx) gets all the words  
NB. required to execute words on (y).
```

```
NB.
```

```
NB. Warning: if the words listed on (y) refer to object or  
NB. locale references this verb returns an error because such  
NB. words generally cannot be run out of context.
```

```
NB.
```

```
NB. monad: getrx clName / blclNames
```

```
NB.
```

```
NB. NB. loads words into base locale
```

```
NB. getrx 'stuffineed'
```

```
NB. getrx ;:'stuff we words need to run'
```

```
NB.
```

```
NB. dyad: clLocale getrx clName / blclNames
```

```
NB.
```

```
NB. 'targetlocale' getrx ;:'load the stuff we need into locale'
```

```
'base' getrx y
```

```
:
```

```

if. badrc uv0=. 31 uses y do. uv0
NB. errmsg: words refer to objects/locales
elseif. #uv1=. obnames uv0 do. (jderr ERR00405),uv1
elseif. uv0=.~.({."1 >{:uv0),refnames uv0
    badrc uv1=. x get uv0 do. uv1
elseif.do.
    ok '(',(":#uv0),OK00406,x
end.
)

hlpnl=: 3 : 0

NB.*hlpnl v-- displays short descriptions of objects on (y)
NB.
NB. monad: hlpnl clName / blclNames
NB.
NB. hlpnl refnames uses 'explainmycalls'
NB.
NB. dyad: iaObject hlpnl clName/blclNames
NB.
NB. 2 hlpnl }.grp''

0 hlpnl y
:
if. empdnl y do. ok ''
elseif. 0=>{.uv0=. (x,EXPLAIN) get y do. uv0
elseif.do.
    uv0=.>{:uv0

```



```
(>{"1 uv0) ; >{"1 uv0
end.
)

jodage=: 3 : 0

NB.*jodage v-- days since last change and creation of JOD
NB. objects.
NB.
NB. monad: jodage cl / blcl
NB.
NB. jodage 'jodage'
NB. jodage }. dnl 're'
NB.
NB. dyad: iaCode jodage cl / blcl
NB.
NB. 2 jodage }. grp''

0 jodage y
:
if. badil x do. jderr ERR001
elseif. y=. ,boxopen y
    badrc changed=. (({.x),14) get y do. changed
elseif. badrc created=. (({.x),13) get y do. created
elseif.do.
    g=. /:daychanged=. <.,.1 dayage <.changed=. rv changed
    daycreated=. ,.<.1 dayage <.created=. rv created
    NB. header=. ;:'name changed created datechanged datecreated'
```

```
header=. AGEHEADER
NB. header ,: (<g) {&.> (>y);daychanged;daycreated;(<,.changed);<,.created
ok<header ,: (<g) {&.> (>y);(<,.created);daycreated;(<,.changed);<daychanged
end.
)

lg=: 3 : 0

NB.*lg v-- make and load JOD group.
NB.
NB. (lg) assembles and loads JOD group scripts. The monad loads
NB. without the postprocessor and the dyad loads with the
NB. postprocessor.
NB.
NB. monad: lg clGroup
NB.
NB.   lg 'groupname' NB. no postprocessor
NB.
NB. dyad: uu lg clGroup
NB.
NB.   2 lg 'group'    NB. no postprocessor
NB.   lg~ 'group'    NB. postprocessor

NB. (/:)=: obfuscate names
2 lg y
:
if. x-:2 do.
  NB. 2_2 make assembles entire group script
```

```

    NB. with preamble regardless of where the
    NB. group appears on the JOD path
    msg=. OK00404 NB. okmsg: group loaded
    t=. 2 _2 make y
else.
    msg=. OK00405 NB. okmsg: group loaded with postprocessor
    t=. 2 mls y
end.
'r s'=. 2{.t
NB. j profile !(*)=. cocurrent
if. r do.
    curr=. 18!:5 '' NB. current locale
    cocurrent 'base' NB. run script from base
    try. 0!:0 s
    catchd.
        cocurrent curr NB. restore locale
        NB. errmsg: J script error in group
        (jderr ERR00404),y;13!:12 ''
        return.
    end.
    cocurrent curr NB. restore locale
    ok (y),msg
else.
    t
end.
)

locgrp=: 3 : 0

```

*NB.*locgrp v-- list groups and suites with name.*

NB.

NB. monad: locgrp clName

NB.

NB. locgrp 'dd'

NB. get group and suite names

```
gs=. 2 3 dnl&.> <''
```

```
if. */ m=. ; {.&> gs do.
```

```
gs=. }.&.> gs
```

```
gnl=. 2 3 }.@:grp &.> &.> gs
```

```
m=. gnl (+./@:e.)&>&.> <<<,y
```

```
ok <GROUPSUITES ,. m#&.> gs
```

```
else.
```

```
>{. (-.m) # &.> gs
```

```
end.
```

```
)
```

```
mls=: 3 : 0
```

*NB.*mls v-- make load script.*

NB.

NB. Generates a J (load) script from a JOD group and an optional

NB. POST_ process macro script.

NB.

NB. monad: mls clGroupName

NB.

```
NB.  NB. generate script and add to public scripts
NB.  mls 'JODaddon'
NB.
NB.  scripts 'e'      NB. JODaddon is now on scripts
NB.  load 'JODaddon'  NB. load's like any J load script
NB.
NB.  dyad:  baPublic mls clGroupName
NB.
NB.  NB. make script but do not add to public scripts
NB.  0 mls 'JODaddon'
NB.
NB.  NB. make script and return text
NB.  2 mls 'JODaddon'

1 mls y
:

NB.  HARDCODE: option qualifier codes
NB.  2 _2 make assembles entire group script
NB.  with preamble regardless of where the
NB.  group appears on the JOD path
v=. 2 _2 make gn=. y -. ' '
'r s'=. 2{.v
if. r do.
  NB. group make succeeded - append any POST_ script
  postpfx=. POSTAMBLEPFX
  if. badrc sp=. 4 dnl postpfx do. sp return. end.
```

```

if. (<ps=. postpfx , gn) e. }.sp do.
  v=. 4 get ps
  'r p'=. 2{.v
  if. r do. s=. s , (2#LF) , (<0;2) {:: p else. v return. end.
end.
if. 2-:x do. ok s
else.
  pdo=. {:0{DPATH__ST__JODobj  NB. put dictionary directory object
  rf=. gf=. SCR__pdo          NB. default directory

  NB. redirect script output if ROOTFOLDER exists and is configured - standard profile !(*)=. jpath
  if. wex <'ROOTFOLDER__pdo' do.
    NB. errmsg: ROOTFOLDER must be a character list configured (jpath) expression like: ~user/jodroot
    if. badcl ROOTFOLDER__pdo do. jderr ERR00407 return. end.
    if. 0 < #rf=. alltrim ROOTFOLDER__pdo do.
      if. '~' ~: {. rf do. jderr ERR00407 return. end.
      NB. do not expand relative path strings - relative paths must be configured
      if. rf -: gt=. jpath rf do. jderr ERR00407 return. else. gf=. tslash2 gt end.
      rf=. tslash2 rf
    else.
      rf=. gf
    end.
  end.
end.

lsn=. gf,gn,IJS__JODobj  NB. errmsg: unable to write load script
if. _1 -: (toHOST s) (write :: _1:) lsn do. (jderr ERR00408),<lsn return. end.
NB. update scripts.ijs

```

```

    x addloadscript gn;rf,gn

end.
else.
    v
end.
)

noexp=: 3 : 0

NB.*noexp v-- returns a list of objects with no explanations.
NB.
NB. monad:  noexp zl/clPattern
NB.
NB.    noexp '' NB. words without short explanations
NB.
NB. dyad:  iaCode noexp zl / clPattern
NB.
NB.    2 noexp 'jod'      NB. groups without explanations
NB.    (i.5) noexp"0 1 '' NB. all objects without explanations

0 noexp y
:
if. badrc uv=.x dnl y do. uv
elseif. a: e. uv      do. ok ''
elseif. badrc uv=. (({.x),EXPLAIN) get }.uv do. uv
elseif. 0=#uv=. rv uv do. ok ''
elseif.do.

```

```
    ok (0 = #&> {:"1 uv) # {."1 uv
end.
)
```

```
notgrp=: 3 : 0
```

```
NB.*notgrp v-- words or tests from (y) that are not in groups or
NB. suites. Useful for finding loose ends and dead code.
```

```
NB.
```

```
NB. monad: notgrp blcl
```

```
NB.
```

```
NB. notgrp }. revo '' NB. recent ungrouped words
```

```
NB.
```

```
NB. dyad: iaObject notgrp blcl
```

```
NB.
```

```
NB. 2 notgrp }. dnl '' NB. ungrouped words
```

```
NB. 3 notgrp }. 1 dnl '' NB. tests that are not in suites
```

```
GROUP notgrp y
```

```
:
```

```
if. badrc y=. checknames y do. y return. end.
```

```
y=. }. y
```

```
select. x
```

```
    case. GROUP do. ok y -. ; grp&.> }. GROUP dnl ''
```

```
    case. SUITE do. ok y -. ; SUITE grp&.> }. SUITE dnl ''
```

```
    case.do. jderr ERR001
```

```
end.
```

```
)
```



```
nt=: 3 : 0
```

```
NB.*nt v-- edit a new test script using JOD conventions.
```

```
NB.
```

```
NB. This verb looks for (TESTSTUB) on the path of open
```

```
NB. dictionaries allowing easy user defined test script formats.
```

```
NB.
```

```
NB. monad:  nt clName
```

```
NB.
```

```
NB.  nt 'scriptname'
```

```
NB.
```

```
NB. dyad:  clSreps nt clName
```

```
NB.
```

```
NB.  NB. the dyad allows more general string
```

```
NB.  NB. replacements to be applied to stubs
```

```
NB.
```

```
NB.  '#{boo}}#<<newboo>>#{hoo}}#??newhoo??' nt 'newsript'
```

```
' ' nt y
```

```
:
```

```
if. badcl y do. jderr ERR002 return. end. NB. errmsg: invalid name(s)
```

```
if. badcl x do. jderr ERR001 return. end. NB. errmsg: invalid option(s)
```

```
name=. y -. ' ' [ dl=. {. x, '/'
```

```
NB. HARDCODE: invalid delimiters
```

```
if. dl e. '{'}~ADST' do. jderr ERR00406 return. end. NB. errmsg: invalid delimiter
```

```

NB. get teststub document from open dictionaries
'r s'=.2{.t=. 1 get TESTSTUB
if. r do.
  'datess times'=.yyyymondd 0
  shortdate=. 2 }. datess
  test=. dl, '{~T~}',dl,name,dl, '{~D~}',dl,datess,dl, '{~SD~}',dl,shortdate
  NB. insert any visible cl !(*)=. CLASSAUTHOR
  NB. NOTE: nouns in locale (ijod) are visible here
  if. wex <'CLASSAUTHOR' do.
    NB. (CLASSAUTHOR) is a cl without (dl)
    if. (-.badcl CLASSAUTHOR) *. -.dl e. CLASSAUTHOR do. test=. test,dl, '{~A~}',dl,CLASSAUTHOR end.
  end.
  name et (test,x) changestr >1{s
else.
  t
end.
)

nw=: 3 : 0

NB.*nw v-- edit a new explicit word using JOD conventions.
NB.
NB. monad:  nw clWord
NB.
NB.    nw 'verb'
NB.
NB. dyad:  iaClass nw clWord
NB.

```

NB. 1 nw 'adverb'

```
3 nw y
:
name=. y -. ' '
if. -.x e. i. 5 do. x=.3 end.
class=. x{'nacvv'
```

NB. user defined post proc !()=. DOCUMENTCOMMAND*

```
if. 0= (4!:0) <'DOCUMENTCOMMAND' do.
  word=.DOCUMENTMARK,LF,LF,DOCUMENTCOMMAND
else.
  word=.DOCUMENTMARK
end.
```

```
reps=. '/{~N~}/',(y-. ' '),'/{~C~}/',("x),'/{~T~}/',class
word=. reps changestr word
name et word
)
```

NB. object/locale names from uses: allnames 31 uses 'name'

```
obnames=: [: /:~ [: ~. [: ; 2: {"1 [: > {:
```

```
onlycomments=: 3 : 0
```

*NB.*onlycomments v-- removes all J code leaving comments.*

NB.

```
NB. monad:  ct =. onlycomments ctJcode
NB.
NB.    onlycomments jcr 'onlycomments' NB. self comments

NB. mask of unquoted comment starts
c =. ($y)$'NB.' E. ,y
c =. -. +./\"1 c > ~:/\"1 y e. ''''
y =. ,y

NB. blank out code
y =. ' ' ((,c)# i. # y)} y
y =. y $~ $c
y #~ y +./ . ~: ' ' NB. remove blank rows
)

NB. put and cross reference word
pr=: 0&globs ,:~ put

NB. referenced nonlocale names from uses:  allnames 31 uses 'name'
refnames=: [: /:~ [: ~. [: ; 1: {"1 [: > {:

revonex=: 3 : 0

NB.*revonex v-- returns a list of put dictionary objects with no
NB. explanations.
NB.
NB. This verb is similiar to (noexp) except it only searches put
```

```
NB. dictionary objects and (noexp) searches the entire path.
NB.
NB. monad: revonex zl / clPattern
NB.
NB. revonex '' NB. put dictionary words without short explanations
NB.
NB. dyad: iaCode revonex zl/clPattern
NB.
NB. 2 revonex 'jod' NB. put dictionary groups without explanations
NB. (i.5) revonex"0 1 '' NB. all put dictionary objects without explanations

/:~ 0 revonex y
:
if. badrc uv=.:~ x revo y do. uv
elseif. a: e. uv do. ok ''
elseif. badrc uv=. (({.x),EXPLAIN) get }.uv do. uv
elseif. 0=#uv=. rv uv do. ok ''
elseif.do.
  ok (0 = #&> {:"1 uv) # {."1 uv
end.
)

today=: 3 : 0

NB.*today v-- returns todays date.
NB.
NB. monad: ilYYYYMMDD =. 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 (today).*

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
)
```

```
updatepublic=: 4 : 0
```

```
NB.*updatepublic v-- updates public scripts table.
```

```
NB.
```

```
NB. dyad: btcl =. btclPublic updatepublic blNamePath
```

```
NB.
```

```
NB. Public_j_ updatepublic 'name';'c:/where/the/script/things/are.ijs'
```

```
p=. (0 {"1 x) i. 0{y
```

```
if. p<#x do.
```

```
  NB. update entry
```

```
  x=. y p} x
```

```
else.
```

```
  NB. new entry - sort public scripts
```

```
  x=. x , y
```

```
  x=. (/:0 {"1 x){x
```

```
end.
)

usedby=: 4 : 0

NB. *usedby v-- returns a list of words from (y) that DIRECTLY
NB. call words on (x). The result of this verb depends on JOD
NB. dictionary references being up-to-date.
NB.
NB. dyad: cl/blcl usedby blcl
NB.
NB. 'wordname' usedby }. dnl ''
NB. ('word'; 'names') usedby }. revo ''
NB.
NB. 'putgs__ST' usedby }. dnl ''

NB. (uses) is expensive for large word lists.
if. badrc uv=.uses y do. uv
else.
  uv=. >{: uv
  names=. boxopen x
  NB. search object and locale references if _ occurs in any name
  col=. >: +./ ' _'&e.&> names
  ok /:~ ({."1 uv) #~ ; (col {"1 uv) +./@e.&> < names
end.
)

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.*jodtools s-- jodtools postprocessor.*

NB. retain whitespace

(9!:41) 1

NB. insure base

cocurrent 'base'

NB. create/initialize a JOD tools object

JODtools_ijod_=: conew 'ajodtools'

NB. new tools object

(1!:2&2) createjodtools__JODtools JODtools,JODobj *NB. pass self and JODs*

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