

# risetset\_notebook

May 19, 2023

## 1 risetset Examples

This notebook demonstrates the [J risetset script](#). `risetset` computes the rise, transit, and set times of named [IAU Stars](#).

To run this notebook you must install a J jupyter kernel. See Martin Saurer's [GitHub repository](#) for instructions.

```
[1]: NB. J version and date
smoutput 9!:14 ''
smoutput 6!:0 ''

NB. set portable box drawing characters
portchars=:[: 9!:7 '+++++++|-'"_ [ ]
portchars 0
```

```
j9.5.0-beta2/j64avx2/windows/commercial/www.jsoftware.com/2023-05-02T22:44:50/c1
ang-15-0-7/SLEEF=1
2023 5 19 10 40 20.726
```

### 1.1 Installation

`risetset` is distributed as a J addon. It is installed in the J `~addons/jacks` folder. It can be installed from [GitHub](#) with:

```
[2]: load 'pacman'
NB. smoutput install 'github:bakerjd99/jackshacks' NB. uncomment to install
```

The `jacks` (J-hacks) addons are self contained [JOD generated](#) J scripts. Each `ijs` script is accompanied with pdf document that describes how to use it. Some scripts, like `risetset` are also packaged with a Jupyter notebook (this file) and a pdf version of the notebook. For example, the `risetset` files are:

```
risetset.ijs
risetset.pdf
risetset_notebook.ipynb
risetset_notebook.pdf
```

There are other scripts in `~addons/jacks` and more will be added from time to time. To refresh the folder, reissue the install command.

In addition to these files the subfolder `~addons/jacks/testdata` contains data files. `riserset` files in `testdata` are:

```
Bright_Stars_Meridian_Almanac_23mar27.md
iau_named_stars_2022.txt
Navigation_Stars.txt
```

```
[3]: NB. addon files
dir '~addons/jacks'
```

```
testdata          <dir>      24-Apr-23 09:06:50
brandxmp.ijs       13295 24-Apr-23 09:06:50
brandxmp.pdf       125252 24-Apr-23 09:06:50
gpxutils.ijs       17079 24-Apr-23 09:06:50
gpxutils.pdf       134318 24-Apr-23 09:06:50
ipynb.ijs          4699 24-Apr-23 09:06:50
ipynb.pdf          86966 24-Apr-23 09:06:50
manifest.ijs       1329 24-Apr-23 09:06:50
riserset.ijs       44288 17-May-23 09:38:15
riserset.pdf       218721 17-May-23 09:38:15
riserset_notebook.ipynb 35704 17-May-23 09:38:15
riserset_notebook.pdf 75229 17-May-23 09:38:15
```

## 1.2 Using riserset

```
[4]: load '~addons/jacks/riserset.ijs' NB. addon version
NB. load 'riserset' NB. dev version
```

```
NB. (riserset) interface word(s): 20230517j90823
NB. -----
NB. baby_today NB. named Babylonian stars rising/setting today
NB. fmt_today NB. format today verbs result
NB. iau_today NB. named IAU stars rising/setting today
NB. loadstars NB. loads riserset star data
NB. nav_today NB. named navigation stars rising/setting today
NB. navdaylist NB. sky safari 6_0 observing list of today's navigation stars
NB. riserset NB. rise, transit, set times of stars
```

```
fmt_today nav_today location_yellowstone 0
```

```
[5]: NB. set a location - add your own by cloning and modifying location verbs
location_yellowstone
```

```
3 : 0
```

```

NB.*location_yellowstone v-- set parameters for Old Faithful location.
NB.
NB. monad: location_yellowstone uuIgnore
NB.
NB. location_yellowstone 0
NB. NB. uses location with current date
NB. iau_today 0
NB.
NB. dyad: bl =. flymfd location_yellowstone uuIgnore
NB.
NB. NB. uses location with yellowstone date
NB. (location_yellowstone 0) iau_today 0
NB.
NB. NB. arbitrary dates for location
NB. fmt_today (1712 3 15.34 location_yellowstone 0) nav_today 0
NB. fmt_today (location_yellowstone~ 1933 9 25.75) iau_today 0

2013 5 7 location_yellowstone y
:
JULIAN_riseset_=: julfrcal ymd=. x

NB. longitude, latitude with standard signs
OBSLOCATION_riseset_=: _110.82792 44.46057
LOCATIONNAME_riseset_=: 'Yellowstone - Old Faithful'

UTCOFFSET_riseset_=: 6.0 NB. MST time zone
LIMITMAG_riseset_=: 6.0 NB. stellar magnitude
LIMITHORZ_riseset_=: 10 NB. degrees above horizon
DARKTRS_riseset_=: 0 NB. minutes before and after sunset (0=ignore sun)

ymd;JULIAN;OBSLOCATION;UTCOFFSET;LIMITMAG;LIMITHORZ;LOCATIONNAME;DARKTRS
)

```

```

[6]: location_yellowstone 0
      'IAU locname sRs cParms'=: iau_today 0

smoutput #IAU      NB. number of rising/setting IAU stars
smoutput locname   NB. location
smoutput sRs       NB. sunrise/sunset

NB. magnitude, deg above horizon, dusk minutes, julian date, ΔT in seconds,
↳ longitude, latitude, year, month day.dd, UTCz
smoutput cParms
NB. star name, designation, transit altitude degrees, transit time 24 hours
↳ minutes
smoutput 5 {. IAU

```

243

Yellowstone - Old Faithful

5 52

20 49

6 10 0 2460083.75 73.504500953125 \_110.82792 44.46057 2023 5 19.25 6

```
+-----+-----+-----+-----+
|Elgafar      |HR 5409|43   |0 6 |
+-----+-----+-----+-----+
|Seginus      |HR 5435|83.5|0 10|
+-----+-----+-----+-----+
|Izar         |HR 5506|72.5|0 23|
+-----+-----+-----+-----+
|Merga        |HR 5533|88.5|0 27|
+-----+-----+-----+-----+
|Zubenelgenubi|HR 5531|29.5|0 29|
+-----+-----+-----+-----+
```

Detailed rise and set information is provided by `riseset`.

```
[7]: LB=: _116.375956 43.646775  NB. Meridian
YMD=: 2023 3 27
UO=: 6 NB. MST UTC offset

NB. star name, (0=rises/sets), altitudes, times fractional day, times hours,
↪minutes
'Rs cParms'=: (YMD;UO;LB) riseset 'Algol';'Rigel';'Spica'
smoutput cParms
smoutput Rs
```

2460030.75 73.40741357812496 \_116.375956 43.646775 2023 3 27.25 6

```
+-----+-----+-----+-----+
|Algol|0| 0.5 0.2910386461449466 6 59|
|      | |87.5 0.6908345293917257 16 35|
|      | |0.5 0.09337060171945516 2 14|
+-----+-----+-----+-----+
|Rigel|0| 1 0.5527905462948185 13 16|
|      | |38 0.7780712498266437 18 40|
|      | |0.5 0.006088476753742347 0 9|
+-----+-----+-----+-----+
|Spica|0| 1 0.9012706582406574 21 38 |
|      | |35 _0.8793144933635634 2 54 |
|      | |0.5 0.3373585646884121 8 6 |
+-----+-----+-----+-----+
```

`fmt_today` formats the results of various `_today` verbs.

```
[8]: fmt_today (location_home 0) iau_today 0
```

```
+-----+-----+-----+-----+
```

```
| Home - Meridian Location |
|           7 37 Sunrise   |
|          20  7 Sunset    |
|             3 Mag-Lim    |
|          20 Above-Horz   |
|          60 Dusk-Min     |
|    2460030.75 Julian     |
|73.40741357812496 ΔT      |
|    _116.375956 Longitude |
|     43.646775 Latitude   |
|          2023 Year       |
|             3 Month       |
|          27.25 Day.dd     |
|             6 UTCz        |
```

```
+-----+
```

```
+-----+-----+-----+-----+
```

```
|Name           |Designation|Tr-Alt-Deg|Tr-24-HrMin|
```

```
+-----+-----+-----+-----+
```

```
|Zosma          |HR 4357    | 67.0     | 0 43       |
|Denebola       |HR 4534    | 61.0     | 1 18       |
|Gienah         |HR 4662    | 28.5     | 1 45       |
|Algorab        |HR 4757    | 29.5     | 1 59       |
|Kraz           |HR 4786    | 23.0     | 2  3       |
|Porrima        |HR 4825    | 45.0     | 2 10       |
|Cor Caroli     |HR 4915    | 84.5     | 2 25       |
|Vindemiatrix   |HR 4932    | 57.0     | 2 31       |
|Spica          |HR 5056    | 35.0     | 2 54       |
|Muphrid        |HR 5235    | 64.5     | 3 23       |
|Arcturus       |HR 5340    | 65.5     | 3 44       |
|Izar           |HR 5506    | 73.5     | 4 13       |
|Zubenelgenubi  |HR 5531    | 30.0     | 4 19       |
|Zubeneschamali|HR 5685    | 37.0     | 4 45       |
|Alphecca       |HR 5793    | 73.0     | 5  3       |
|Unukalhai      |HR 5854    | 52.5     | 5 12       |
|Dschubba       |HR 5953    | 23.5     | 5 29       |
|Acrab          |HR 5984    | 26.5     | 5 34       |
|Yed Prior     |HR 6056    | 42.5     | 5 42       |
|Alniyat        |HR 6084    | 20.5     | 5 49       |
|Kornephoros    |HR 6148    | 68.0     | 5 58       |
|Pollux         |HR 2990    | 74.5     | 21 11      |
|Tureis         |HR 3185    | 22.0     | 21 33      |
|Alphard        |HR 3748    | 37.5     | 22 53      |
|Regulus        |HR 3982    | 58.0     | 23 34      |
|Algieba        |HR 4057    | 66.0     | 23 45      |
```

```
+-----+-----+-----+-----+
```

```
[9]: fmt_today (location_home 0) nav_today 0
```

```

+-----+
| Home - Meridian Location |
|       7 37 Sunrise      |
|       20 7 Sunset       |
|       3 Mag-Lim         |
|       20 Above-Horz     |
|       60 Dusk-Min       |
|       2460030.75 Julian  |
| 73.40741357812496 ΔT    |
|       _116.375956 Longitude |
|       43.646775 Latitude |
|       2023 Year         |
|       3 Month           |
|       27.25 Day.dd      |
|       6 UTCz            |
+-----+
+-----+-----+-----+-----+
|Name          |Designation|Tr-Alt-Deg|Tr-24-HrMin|
+-----+-----+-----+-----+
|Denebola      |HR 4534   | 61.0     | 1 18      |
|Gienah        |HR 4662   | 28.5     | 1 45      |
|Spica         |HR 5056   | 35.0     | 2 54      |
|Arcturus      |HR 5340   | 65.5     | 3 44      |
|Zubenelgenubi|HR 5531   | 30.0     | 4 19      |
|Alphecca      |HR 5793   | 73.0     | 5 3       |
|Pollux        |HR 2990   | 74.5     | 21 11     |
|Alphard       |HR 3748   | 37.5     | 22 53     |
|Regulus       |HR 3982   | 58.0     | 23 34     |
+-----+-----+-----+-----+

```

The stars listed by `riseset` come from IAU named stars.

[10]: *NB. leading characters from UTF-8 CSV IAU star data file*  
800 {`. read jpath '~addons/jacks/testdata/iau_named_stars_2022.txt'`

```

IAU_Name,Designation,HIP,Bayer_Name,Nm,WDS_J,Vmag,RA_J2000,Dec_J2000,Origin,Source,
ID,Const,Etymology_Note
Absolutno,X0-5,X0-5,_ Lyn,,_,12.13,116.716506,39.094572,2019 IAU100
NameExoWorlds,https://www.nameexoworlds.iau.org/2019approved-names,_Lyn,Czech
Republic proposal;Absolutno is a fictional miraculous substance in the sci-fi
novel Továrna na absolutno (T...
Acamar,HR 897,13847, 1 Eri,A,02583-4018,2.88,44.565311,-40.304672,,, 1,Eri,
Achernar,HR 472,7588, Eri,A,-,0.45,24.428523,-57.236753,Arabic,, ,Eri,The name
was originally Arabic: ʾāḥīr an-nahr ('river's end').
Achird,HR 219,3821, Cas,A,00491+5749,3.46,12.276213,57.815187,,, ,Cas,"first
applied to Cassiopeiae in the Skalnate Pleso

```

```
[11]: loadstars~ 2
smoutput 'Named stars:', "#IAU_Name
smoutput 10 {. IAU_Name
```

Named stars:449

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|Absolutno|Acamar|Achernar|Achird|Acrab|Acrux|Acubens|Adhafera|Adhara|Adhil|
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

Additional stars/objects can be added by editing the IAU file or by doing the following.

New objects need a name, right ascension (RA), and declination (Dec) for the J2000.0 epoch.

```
[12]: NB. meeus pg. 99,100
LB=: _71.0833 42.3333 NB. Boston
YMD=: 1988 3 20
UO=: 0
NB. add objects not in IAU names - needs - name, ra, dec
AOB=. (<;:'Venus'),(<41.73129),<18.44092
AOB=. ,&. (>;:'OBJ_Name OBJ_RA_J2000 OBJ_Dec_J2000'),. AOB
DeltaTsOverride_riseset_=: 56
'Vrs cParms'=: (YMD;UO;LB;<AOB) riseset 'Venus'
0 0$erase 'DeltaTsOverride_riseset_'
smoutput cParms
smoutput Vrs
```

```
2447240.5 56 _71.08329999999999 42.3333 1988 3 20 0
```

```
+-----+-----+-----+-----+-----+
|Venus|0| 1 0.5211284270665463 12 30|
|      | | 66 0.8169433896164773 19 36|
|      | |0.5 0.1154978057116963 2 46|
+-----+-----+-----+-----+-----+
```

### 1.3 Maintaining and modifying riseset

All **riseset** code, documentation and test scripts are stored in the JOD dictionary **futs**. To change the code or run the test cases you need to install the JOD dictionaries **futs** and **utils**.

Use J's package manager to install the JOD addons **general/jod**, **general/joddocument**. If you have installed all the addons JOD is already on your system.

After installing JOD do:

1. Download the JOD dump scripts:

<https://github.com/bakerjd99/joddumps/blob/master/utils.ijs>

<https://github.com/bakerjd99/joddumps/blob/master/futs.ijs>

and put them in a **~temp** folder.

2. Start JOD and check for the presence of **futs** and **utils**.

```

NB. start JOD
load 'general/jod'
(;;'futs utils') e. od''

```

### 3. Only if both dictionaries are missing do:

```

newd 'utils' NB. creates utils dictionary in '~user/joddicts/utils'
newd 'futs' NB. creates futs in '~user/joddicts/futs'

```

### 4. Load the dictionaries:

```

NB. load utils first
od 'utils' [ 3 od ''
0!:0 <jpath '~temp/utils.ijs'
NB. rebuild references
0 globs&> }. revo ''
NB. take first binary backup
packd 'utils'

NB. load futs with utils on path
od ;:'futs utils' [ 3 od ''
0!:0 <jpath '~temp/futs.ijs'
NB. rebuild references
0 globs&> }. revo ''
NB. take first binary backup
packd 'futs'

NB. close dictionaries
3 od ''

```

The rest of this notebook *assumes* you have installed futs and utils.

It also assumes a basic knowledge of JOD. See the JOD Manual for details. The JOD Manual is distributed in the `general/joddocument` addon - see:

```
~addons/general/joddocument/pdfdoc/jod.pdf
```

jod.pdf is also available on [The JOD Page](#)

## 1.4 riseset test suite

Many riseset test cases are in futs. Groups of test cases are called suites. The contents of the riseset suite is:

```

[13]: NB. open futs and utils - assumed open until notebook end
load 'general/jod'
od ;:'futs utils' [ 3 od ''

```

```

++-----+-----+
|1|opened (rw/ro) ->|futs|utils|
++-----+-----+

```



```
[14]: NB. list test cases in (riseset) suite
smoutput ,. }. 3 grp 'riseset'
```

```
+-----+
|riseset_atan2_smoke      |
+-----+
|riseset_espenak_smoke    |
+-----+
|riseset_meeus_smoke      |
+-----+
|riseset_navstars_ecu_smoke |
+-----+
|riseset_navstars_safari_smoke|
+-----+
|riseset_riseset_smoke    |
+-----+
|riseset_tanner_smoke     |
+-----+
```

```
[15]: NB. show test case
1 disp 'riseset_riseset_smoke'
```

```
NB.*riseset_riseset_smoke t-- (riseset) smoke tests.
NB.
NB. created: 2023mar27
NB. changes: -----
NB. 23apr01 location name added
NB. 23apr23 adjust for sunrise/set filtering
NB. 23apr27 adjust for sunrise/set

load 'riseset'

NB. meeus pg. 99,100
LB=: _71.0833 42.3333 NB. Boston
YMD=: 1988 3 20
UO=: 0
NB. add objects not in IAU names - needs - name, ra, dec
AOB=. (<: 'Venus'), (<41.73129), <18.44092
AOB=. ,&.> (<: 'OBJ_Name OBJ_RA_J2000 OBJ_Dec_J2000') ,. AOB
DeltaTsOverride_riseset=: 56
'Vrs cParms'=: (YMD;UO;LB;<AOB) riseset 'Venus'
0 0$erase 'DeltaTsOverride_riseset_'

NB. values are within 10 minutes of the meeus book
NB. result - not great but good enough for demo work
Meeusmin=: +/" 1 ] 60 1 *"1 ] 12 25 , 19 41 ,: 2 55
10 > >./|Meeusmin - +/" 1 ] 60 1 *"1 ] _2 {."1 ;2 {"1 Vrs
```

```

LB=: _116.375956 43.646775    NB. Meridian
YMD=: 2023 3 27
UO=: 6                        NB. MST UTC offset

'Rs cParms'=: (YMD;UO;LB) riseset 'Algol'
'Rs cParms'=: (YMD;UO;LB) riseset 'Algol';'Rigel';'Spica'

NB. Bright Stars for 2023 3 27 Meridian
NB. https://www.almanac.com/astronomy/bright-stars/zipcode/83646/2023-03-27
Bs=: ;:'Altair Deneb Fomalhaut Algol Aldebaran Rigel Capella Bellatrix'
Bs=: Bs,;:'Betelgeuse Sirius Procyon Pollux Regulus Spica Arcturus Antares Vega'

'Rs cParms'=: (YMD;UO;LB) riseset Bs

NB. transits match fairly well rise/sets differ 5 to 10 minutes
BsTransit=: 9 18,10 8,12 25,16 35,18 2,18 41,18 43,:18 51
BsTransit=: BsTransit , 19 21,20 11,21 5,21 11,23 34,2 54,3 44,5 58,:8 4

NB. transit altitude degrees
BsAlt=: 55 88 16 87 62 38 87 52
BsAlt=: BsAlt,53 29 51 74 58 35 65 19 85

TMP=: {:"1 Rs
ALT=: ((<1;,0)&{&> TMP) ,. BsAlt
TRT=: ((<1;2 3)&{&> TMP) ,. BsTransit

NB. altitudes match to 1 degree
1 = >./ -/"1 ALT

NB. transit times match to 1 minute in worst case
1 = >./ | (60 #:^:_1 ] 0 1 {"1 TRT) - 60 #:^:_1 ] 2 3 {"1 TRT

'IAU NAV'=: loadstars 0
({."1 NAV)=: {"1 NAV
({."1 IAU)=: {"1 IAU
'Navrs cParms'=: (YMD;UO;LB) riseset Nav_Star_Name
'Iaurs cParms'=: (YMD;UO;LB) riseset IAU_Name

NB. default
'Meridianrs lName sRs cParms'=: iau_today 0

NB. date of Uluru star party diner
uJD=: julfrcal uYMD=: 2022 10 19
ULURU=: 131.01941 _25.34301
uUTC=: _9.5
uLMAG=: 6.0
uLHORZ=: 5
uNAME=: 'Uluru - star party diner'

```

```

uDark=: 0
'Ulururs lName sRs cParms'=: (uYMD;uJD;ULURU;uUTC;uLMAG;uLHORZ;uNAME;uDark)
iau_today 0
'Ulururs lName sRs cParms'=: (uYMD;uJD;ULURU;uUTC;uLMAG;uLHORZ;uNAME;uDark)
nav_today 0

'Navrs lName sRs cParms'=: (location_yellowstone~ 1933 9 25.75) iau_today 0
'Navrs lName sRs cParms'=: (location_home~ 1956 7 18) nav_today 0
'Navrs lName sRs cParms'=: (location_uluru~ 2043 7 2) nav_today 0

0 0$erase 'AOB Meeusmin Vrs LB YMD UO Rs Bs BsTransit BsAlt TMP ALT TRT Navrs
Iaurs cParms'
0 0$erase (;:'IAU NAV') , ({."1 NAV), {. "1 IAU
0 0$erase 'uYMD uJD ULURU uUTC uLMAG uLHORZ Meridianrs Ulururs uDark uNAME lName
sRs'

smoutput 'PASSED:: riseset_riseset_smoke'

```

[16]: *NB. run all the test cases in the suite*  
*NB. suppressing all but (smoutput) output*  
*NB. Each test will show PASSED:: if OK.*  
4 rtt 'riseset'

```

NB. (riseset) interface word(s): 20230519j103153
NB. -----
NB. baby_today  NB. named Babylonian stars rising/setting today
NB. fmt_today   NB. format today verbs result
NB. iau_today   NB. named IAU stars rising/setting today
NB. loadstars   NB. loads riseset star data
NB. nav_today   NB. named navigation stars rising/setting today
NB. navdaylist  NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset     NB. rise, transit, set times of stars

```

```

    fmt_today nav_today location_yellowstone 0

```

```

PASSED:: riseset_atan2_smoke
NB. (riseset) interface word(s): 20230519j103153
NB. -----
NB. baby_today  NB. named Babylonian stars rising/setting today
NB. fmt_today   NB. format today verbs result
NB. iau_today   NB. named IAU stars rising/setting today
NB. loadstars   NB. loads riseset star data
NB. nav_today   NB. named navigation stars rising/setting today
NB. navdaylist  NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset     NB. rise, transit, set times of stars

```

```

    fmt_today nav_today location_yellowstone 0

```

```

PASSED:: riseset_espenak_smoke
NB. (riseset) interface word(s): 20230519j103153
NB. -----
NB. baby_today  NB. named Babylonian stars rising/setting today
NB. fmt_today   NB. format today verbs result
NB. iau_today   NB. named IAU stars rising/setting today
NB. loadstars   NB. loads riseset star data
NB. nav_today   NB. named navigation stars rising/setting today
NB. navdaylist  NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset     NB. rise, transit, set times of stars

```

```

fmt_today nav_today location_yellowstone 0

```

```

PASSED:: riseset_meeus_smoke
NB. (riseset) interface word(s): 20230519j103153
NB. -----
NB. baby_today  NB. named Babylonian stars rising/setting today
NB. fmt_today   NB. format today verbs result
NB. iau_today   NB. named IAU stars rising/setting today
NB. loadstars   NB. loads riseset star data
NB. nav_today   NB. named navigation stars rising/setting today
NB. navdaylist  NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset     NB. rise, transit, set times of stars

```

```

fmt_today nav_today location_yellowstone 0

```

```

ECU riseset ALL/NORTH/SOUTH HrMin freq/stats =====
raw mean: _0.2796934865900383
distribution absolute minute diffs
 0  1  2  3  4  5  6  7
10 75 69 65 27 7 6 2
stats absolute minute diffs
sample size:      261
minimum:          0
maximum:          7
1st quartile:     1
2nd quartile:     2
3rd quartile:     3
first mode:       1
first antimode:   7
mean:             2.3027
std devn:         1.3489
skewness:         0.8041
kurtosis:         3.7348

```

```

PASSED:: riseset_navstars_ecu_smoke
NB. (riseset) interface word(s): 20230519j103153
NB. -----
NB. baby_today  NB. named Babylonian stars rising/setting today

```

```

NB. fmt_today      NB. format today verbs result
NB. iau_today      NB. named IAU stars rising/setting today
NB. loadstars      NB. loads riseset star data
NB. nav_today      NB. named navigation stars rising/setting today
NB. navdaylist     NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset        NB. rise, transit, set times of stars

```

```

      fmt_today nav_today location_yellowstone 0

```

```

SKY riseset ALL/NORTH/SOUTH HrMin freq/stats =====

```

```

raw hrmin mean: _0.02040816326530612

```

```

distribution absolute minute diffs

```

```

0 1

```

```

48 1

```

```

stats absolute minute diffs

```

```

sample size:          49

```

```

minimum:              0

```

```

maximum:              1

```

```

1st quartile:         _

```

```

2nd quartile:         0

```

```

3rd quartile:         1

```

```

first mode:           0

```

```

first antimode:       1

```

```

mean:                 0.0204

```

```

std devn:             0.1429

```

```

skewness:             6.7839

```

```

kurtosis:             47.0208

```

```

SKY riseset ALL/NORTH/SOUTH Altitude freq/stats =====

```

```

raw hrmin mean: 0.01224489795918367

```

```

distribution absolute altitude diffs

```

```

0 0.1 0.2

```

```

7 24 18

```

```

stats absolute altitude diffs

```

```

sample size:          49

```

```

minimum:              0

```

```

maximum:              0.2

```

```

1st quartile:         0

```

```

2nd quartile:         0.1

```

```

3rd quartile:         0.2

```

```

first mode:           0.1

```

```

first antimode:       0

```

```

mean:                 0.1224

```

```

std devn:             0.06850000000000001

```

```

skewness:             _0.3095

```

```

kurtosis:             2.1534

```

```

PASSED:: riseset_navstars_safari_smoke

```

```

NB. (riseset) interface word(s): 20230519j103153

```

```

NB. -----

```

```

NB. baby_today  NB. named Babylonian stars rising/setting today
NB. fmt_today   NB. format today verbs result
NB. iau_today   NB. named IAU stars rising/setting today
NB. loadstars   NB. loads riseset star data
NB. nav_today   NB. named navigation stars rising/setting today
NB. navdaylist  NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset     NB. rise, transit, set times of stars

```

```
fmt_today nav_today location_yellowstone 0
```

```

PASSED:: riseset_riseset_smoke
NB. (riseset) interface word(s): 20230519j103153
NB. -----
NB. baby_today  NB. named Babylonian stars rising/setting today
NB. fmt_today   NB. format today verbs result
NB. iau_today   NB. named IAU stars rising/setting today
NB. loadstars   NB. loads riseset star data
NB. nav_today   NB. named navigation stars rising/setting today
NB. navdaylist  NB. sky safari 6_0 observing list of today's navigation stars
NB. riseset     NB. rise, transit, set times of stars

```

```
fmt_today nav_today location_yellowstone 0
```

```

PASSED:: riseset_tanner_smoke
1

```

## 1.5 Building riseset

There are a number of test scripts in `futs` that build and distribute `riseset`. These scripts are tuned to my environment but they do illustrate how to *make* a distribution script.

```

[17]: NB. show main riseset maker
portchars 0
NB. leading characters
smoutput 500 {. 1 disp 'build_riseset'
3 od ''

```

```

NB.*build_riseset t-- build (riseset) and distribute.
NB.
NB. created: 2023mar09
NB. changes: -----
NB. 23may10 add notebook to distributed files
NB. 23may16 match working notebook with ~temp/ version

coclass tmploc_AAAbuild999=: 'AAAbuild999' [ coerase <'AAAbuild999'
coinert 'ijod'

scrn=: 'riseset'

```

```
>0{OPENDIC=: did 0
```

NB. if (imex) is first dictionary on path include it  
headdic=: ('imex'-:>1{OPENDIC) #'imex '

```
>0{od ;: headd
```

```
+-+-----+-----+-----+  
|1|closed ->|futs|utils|  
+-+-----+-----+-----+
```

1.6 All done - thanks for playing