

risetset_notebook

May 16, 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
```

```
j9.4.2/j64avx2/windows/commercial/www.jssoftware.com/2023-04-10T01:19:53/clang-15
-0-7/SLEEF=1
2023 5 16 13 8 28.553
```

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>      08-Apr-23 13:03:53
brandxmp.ijs      13295 28-Mar-23 22:45:21
brandxmp.pdf      125252 28-Mar-23 22:45:21
gpxutils.ijs      17079 13-Apr-23 10:07:39
gpxutils.pdf      134318 13-Apr-23 10:07:39
ipynb.ijs         4699 28-Mar-23 22:45:21
ipynb.pdf         86966 28-Mar-23 22:45:21
manifest.ijs      1329 08-Apr-23 13:00:01
riserset.ijs      44327 10-May-23 11:22:12
riserset.pdf      218616 10-May-23 11:22:12
riserset_notebook.ipynb 35014 27-Apr-23 12:40:09
riserset_notebook.pdf 74421 27-Apr-23 12:40:09
```

1.2 Using riserset

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

smoutput 'NB. vmd: ' , , '0,p<; >q<; >0,0' (8!:2) VMDriserset
```

```
NB. (riserset) interface word(s): 20230510j110904
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_home 0

NB. vmd: 0.9.82; 3; 10 May 2023 11:09:04
```

```
[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 55
20 46
6 10 0 2460080.75 73.504500953125 _110.82792 44.46057 2023 5 16.25 6
+-----+-----+-----+
|Kang      |HR 5315|35   |0 3|
+-----+-----+-----+
|Arcturus  |HR 5340|64.5|0 5|
+-----+-----+-----+
|Syrma     |HR 5338|39.5|0 6|
+-----+-----+-----+
|Xuange    |HR 5351|88.5|0 6|
+-----+-----+-----+
|Khambalia|HR 5359|32   |0 9|
+-----+-----+-----+
```

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 `riserset` 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:
      °āḥir 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_risaset_=: 56
'Vrs cParms'=: (YMD;UO;LB;<AOB) risaset 'Venus'
0 0$erase 'DeltaTsOverride_risaset_'
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 risaset

All **risaset** 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): 20230516j123457
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_home 0

```

```

PASSED:: riseset_atan2_smoke
NB. (riseset) interface word(s): 20230516j123457
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_home 0

PASSED:: riseset_espenak_smoke

NB. (riseset) interface word(s): 20230516j123457

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_home 0

PASSED:: riseset_meeus_smoke

NB. (riseset) interface word(s): 20230516j123457

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_home 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): 20230516j123457
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_home 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): 20230516j123457
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_home 0

```

```

PASSED:: riseset_riseset_smoke
NB. (riseset) interface word(s): 20230516j123457
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_home 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

```

```

coclass tmploc_AAAbuild999_=: 'AAAbuild999' [ coerase <'AAAbuild999'

```

```
coininsert 'ijod'
```

```
scrn=: 'riseset'
```

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

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

```
>0{od ;: headdic,'futs utils' [ 3 od ''
```

```
>0{tmploc get ;:'gettxt get
```

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

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

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

1.6 All done - thanks for playing