Investigating and fixing a new CRAN check error in my OneSampleMR package

Tom Palmer, MRC IEU and PHS, Bristol Medical School, University of Bristol
20/05/2022

MRC Integrative Epidemiology Unit

University of BRISTOL

Overview

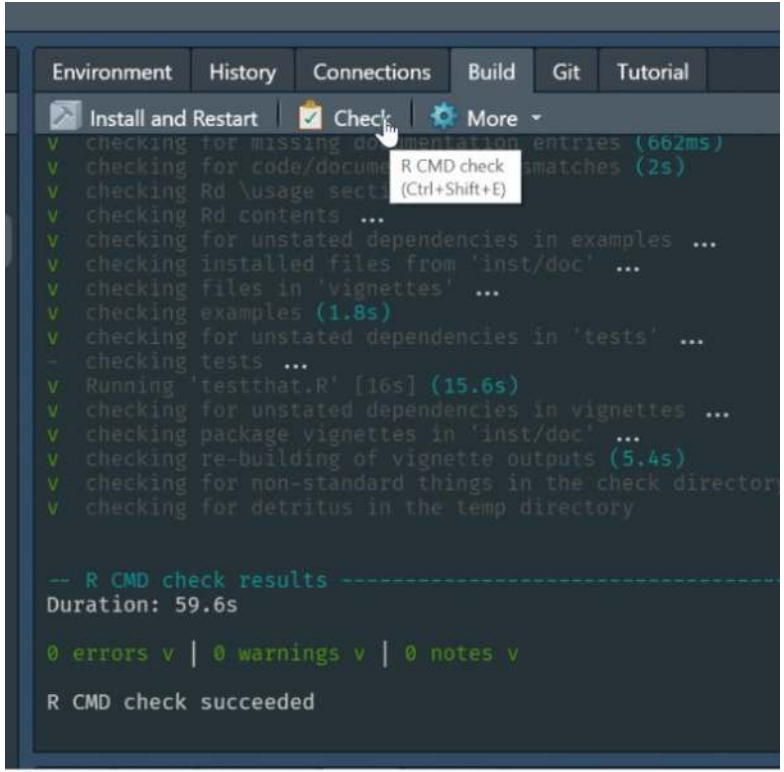
- Introduction
- Investigating
- Fixing
- What happened next?
- Conclusion

Introduction

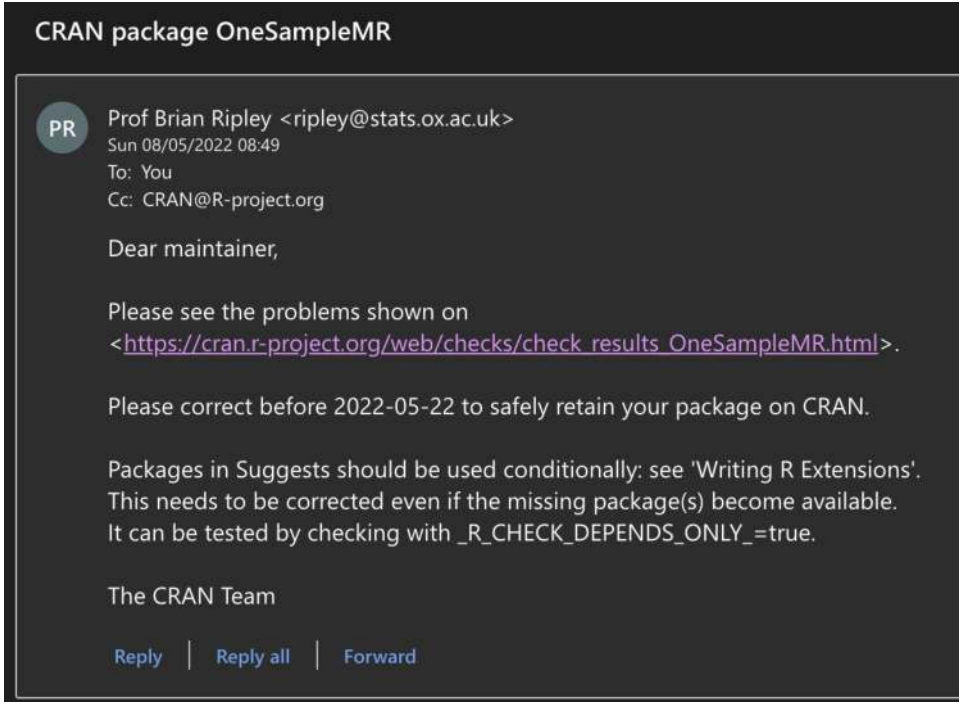
- To be accepted onto CRAN or Bioconductor R packages must pass

  `R CMD check / devtools::check()`

- Further info from my Code Club session https://remlapmot.github.io/r-pkg-tips/
- CRAN have special/pseudo-secret additional check settings
- First submit to https://builder.r-hub.io/ and https://win-builder.r-project.org/ fix then submit to CRAN then 🤞

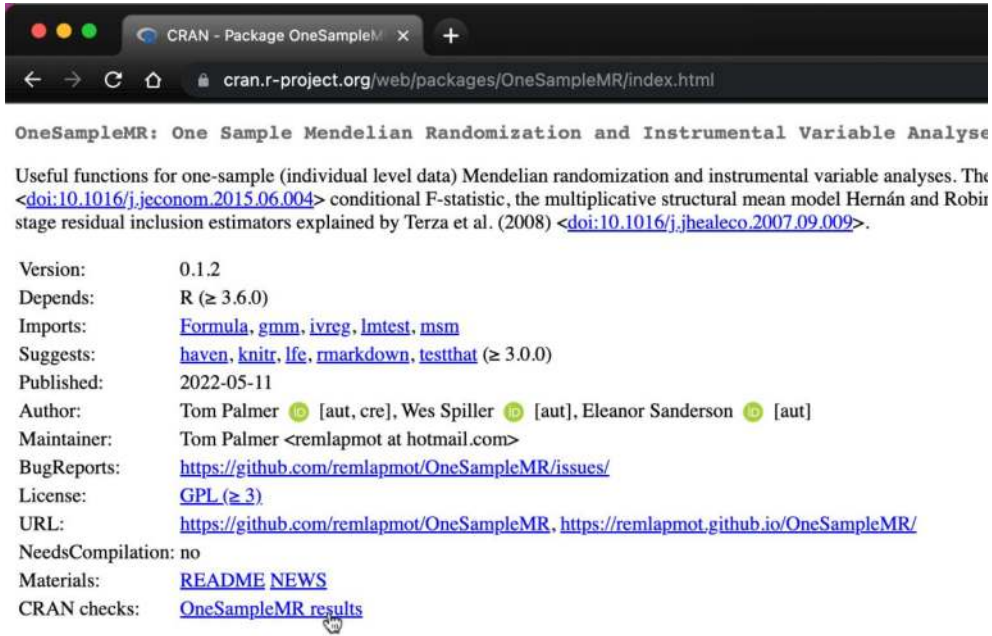


- 2 releases of OneSampleMR accepted onto CRAN …
- … then … email from CRAN Team
  - New problem/s
  - 2 week deadline to fix otherwise package will be removed/archived and hence no longer available using `install.packages()`



Investigating

- Go to package CRAN page
- Then to CRAN checks link



- Error on 4 Linux sub-architectures
- Those weren't there a few days ago or when I sent in the 2 previous versions

CRAN Package Check Results for Package **OneSampleMR**

Last updated on 2022-05-10 13:50:43 CEST.

Flavor	Version	$T_{install}$	T_{check}	T_{total}	Status	Flags
r-devel-linux-x86_64-debian-clang	0.1.1	4.52	64.02	68.54	ERROR	
r-devel-linux-x86_64-debian-gcc	0.1.1	3.45	48.58	52.03	ERROR	
r-devel-linux-x86_64-fedora-clang	0.1.1			83.36	ERROR	
r-devel-linux-x86_64-fedora-gcc	0.1.1			77.77	ERROR	
r-devel-windows-x86_64	0.1.1	29.00	97.00	126.00	OK	
r-patched-linux-x86_64	0.1.1	4.64	62.86	67.50	OK	
r-release-linux-x86_64	0.1.1	4.17	62.42	66.59	OK	
r-release-macos-arm64	0.1.1			29.00	OK	
r-release-macos-x86_64	0.1.0			45.00	OK	
r-release-windows-x86_64	0.1.1	27.00	95.00	122.00	OK	
r-oldrel-macos-arm64	0.1.1			28.00	OK	
r-oldrel-macos-x86_64	0.1.1			47.00	OK	
r-oldrel-windows-ix86+x86_64	0.1.1	13.00	84.00	97.00	OK	

- (bottom of previous screen)
- Crucial lines:
  - NOTE: Package **suggested** (in Suggests list in DESCRIPTION file) but not available for checking: 'ivtools'
  - ERROR: Error processing vignette … there is no package called 'ivtools'

Additional issues

noSuggests

Check Details

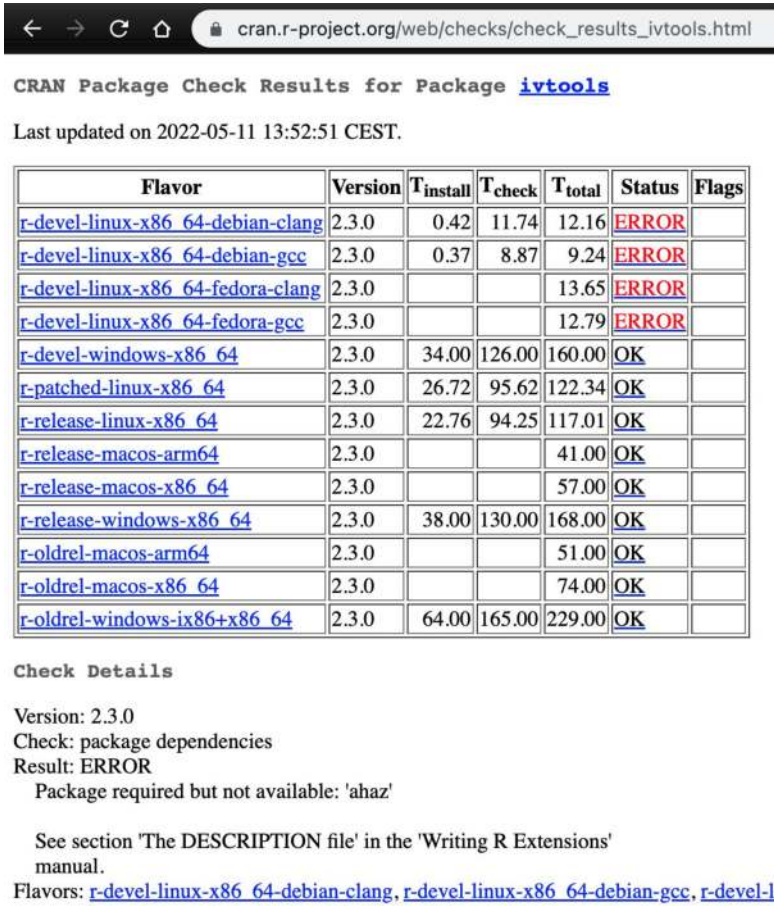
Version: 0.1.1
Check: package dependencies
Result: NOTE
Package suggested but not available for checking: 'ivtools'
Flavors: r-devel-linux-x86_64-debian-clang, r-devel-linux-x86_64-debian-gcc

Version: 0.1.1
Check: re-building of vignette outputs
Result: ERROR
Error(s) in re-building vignettes:
...
--- re-building 'compare-smm-fits.Rmd' using rmarkdown
Quitting from lines 18-20 (compare-smm-fits.Rmd)
Error: processing vignette 'compare-smm-fits.Rmd' failed with diagnostics:
there is no package called 'ivtools'
--- failed re-building 'compare-smm-fits.Rmd'

- (part of) DESCRIPTION file

```
Imports:
    Formula,
    gmm,
    ivreg,
    lmtest,
    msm
Suggests:
    AER,
    haven,
    ivtools,
    knitr,
    lfe,
    rmarkdown,
    testthat (>= 3.0.0)
VignetteBuilder:
    knitr
Config/testthat/edition: 3
Encoding: UTF-8
Roxygen: list(markdown = TRUE)
RoxygenNote: 7.1.2
```

- Investigate ivtools check results
- Error for the same 4 Linux sub-architectures
- Similar but not identical crucial line:
  - ERROR: Package **required** (in Imports list in DESCRIPTION file) but not available: 'ahaz'



cran.r-project.org/web/checks/check_results_ivtools.html

CRAN Package Check Results for Package ivtools

Last updated on 2022-05-11 13:52:51 CEST.

Flavor	Version	$T_{install}$	T_{check}	T_{total}	Status	Flags
r-devel-linux-x86_64-debian-clang	2.3.0	0.42	11.74	12.16	ERROR	
r-devel-linux-x86_64-debian-gcc	2.3.0	0.37	8.87	9.24	ERROR	
r-devel-linux-x86_64-fedora-clang	2.3.0			13.65	ERROR	
r-devel-linux-x86_64-fedora-gcc	2.3.0			12.79	ERROR	
r-devel-windows-x86_64	2.3.0	34.00	126.00	160.00	OK	
r-patched-linux-x86_64	2.3.0	26.72	95.62	122.34	OK	
r-release-linux-x86_64	2.3.0	22.76	94.25	117.01	OK	
r-release-macos-arm64	2.3.0			41.00	OK	
r-release-macos-x86_64	2.3.0			57.00	OK	
r-release-windows-x86_64	2.3.0	38.00	130.00	168.00	OK	
r-oldrel-macos-arm64	2.3.0			51.00	OK	
r-oldrel-macos-x86_64	2.3.0			74.00	OK	
r-oldrel-windows-ix86+x86_64	2.3.0	64.00	165.00	229.00	OK	

Check Details

Version: 2.3.0
Check: package dependencies
Result: ERROR
Package required but not available: 'ahaz'

See section 'The DESCRIPTION file' in the 'Writing R Extensions' manual.
Flavors: r-devel-linux-x86_64-debian-clang, r-devel-linux-x86_64-debian-gcc, r-devel-l

- Investigate ahaz check results
- Error on the same 4 Linux sub-architectures
- Crucial line:
  - Installation failed
- … we have found the source of the error

cran.r-project.org/web/checks/check_results_ahaz.html

CRAN Package Check Results for Package ahaz

Last updated on 2022-05-11 13:52:42 CEST.

Flavor	Version	$T_{install}$	T_{check}	T_{total}	Status	Flags
r-devel-linux-x86_64-debian-clang	1.14	0.45	11.98	12.43	ERROR	
r-devel-linux-x86_64-debian-gcc	1.14	0.52	9.06	9.58	ERROR	
r-devel-linux-x86_64-fedora-clang	1.14			14.65	ERROR	
r-devel-linux-x86_64-fedora-gcc	1.14			13.56	ERROR	
r-devel-windows-x86_64	1.14	25.00	106.00	131.00	NOTE	
r-patched-linux-x86_64	1.14	9.95	85.16	95.11	NOTE	
r-release-linux-x86_64	1.14	10.22	85.12	95.34	NOTE	
r-release-macos-arm64	1.14			37.00	NOTE	
r-release-macos-x86_64	1.14			48.00	NOTE	
r-release-windows-x86_64	1.14	24.00	103.00	127.00	NOTE	
r-oldrel-macos-arm64	1.14			44.00	NOTE	
r-oldrel-macos-x86_64	1.14			67.00	NOTE	
r-oldrel-windows-ix86+x86_64	1.14	24.00	130.00	154.00	NOTE	

Additional issues

BLAS

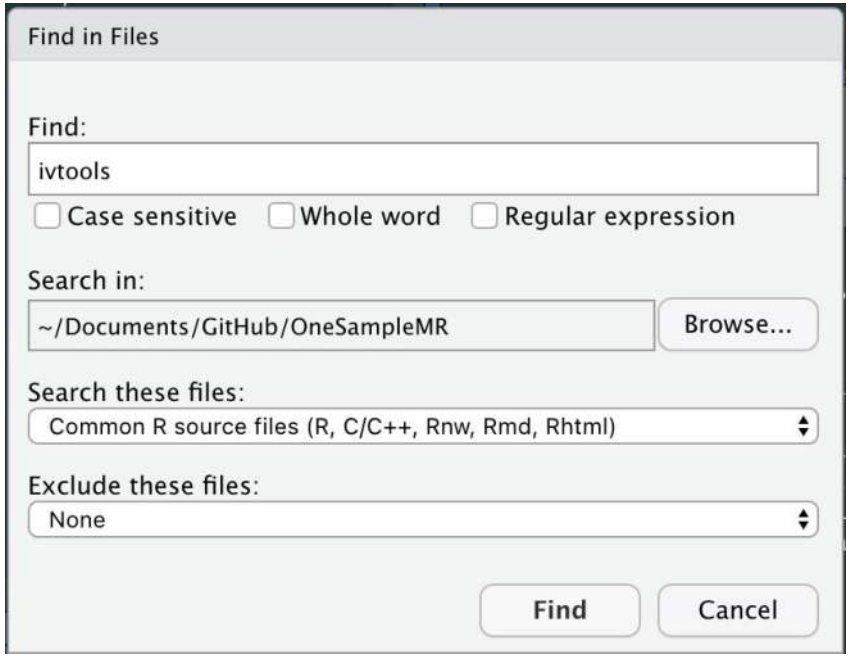
Check Details

Version: 1.14
Check: whether package can be installed
Result: ERROR
Installation failed.
Flavors: r-devel-linux-x86_64-debian-clang, r-devel-linux-x86_64-debian-gcc, r-devel

- Click on one of the errors then on the installation log file
- Some C code has failed to build
  - maybe R-devel requires different settings/C code syntax
  - maybe CRAN have changed their setup

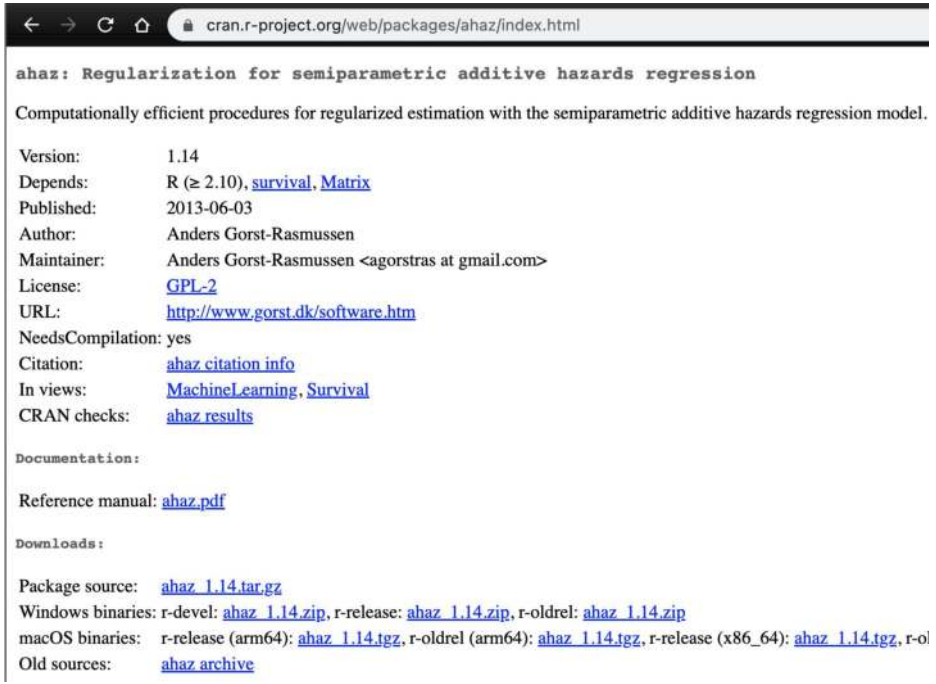
Fixing

- Open OneSampleMR repo as RStudio project (i.e., double click .Rproj file)
- Search for "ivtools" using Find in Files (Ctrl/Cmd + Shift + F) (restrict to Common R source files)



- Only used in a vignette and some test files

- When were ahaz and ivtools last updated?
  - ivtools: 2020-02-24
  - ahaz: 2013-06-03
- Question to the group: what strategies would solve the error for
  - ahaz
  - ivtools
  - OneSampleMR
  - … and will the solutions be the same?



- My fix
  - Removed use of ivtools in OneSampleMR and resubmitted to CRAN
  - Back to no errors

CRAN Package Check Results for Package OneSampleMR

Last updated on 2022-05-15 08:54:57 CEST.

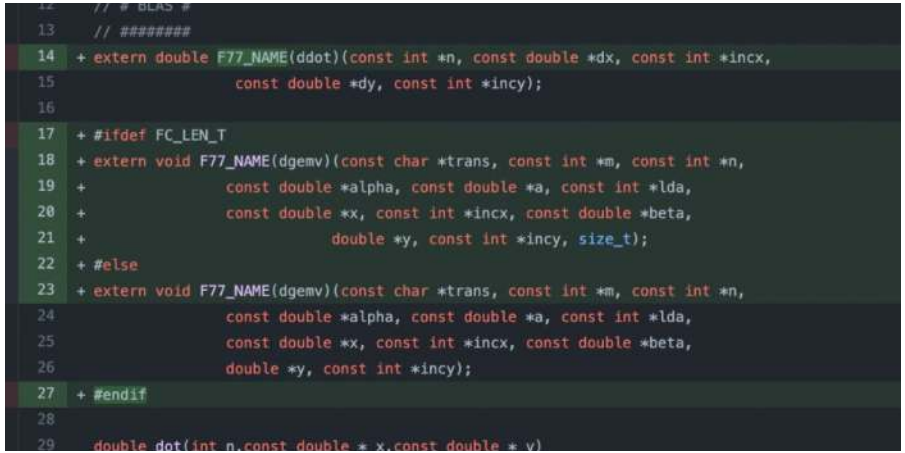
Flavor	Version	$T_{install}$	T_{check}	T_{total}	Status	Flags
r-devel-linux-x86_64-debian-clang	0.1.2	5.12	64.65	69.77	OK	
r-devel-linux-x86_64-debian-gcc	0.1.2	3.57	48.78	52.35	OK	
r-devel-linux-x86_64-fedora-clang	0.1.2			86.35	OK	
r-devel-linux-x86_64-fedora-gcc	0.1.2			84.16	OK	
r-devel-windows-x86_64	0.1.2	31.00	94.00	125.00	OK	
r-patched-linux-x86_64	0.1.2	3.72	61.19	64.91	OK	
r-release-linux-x86_64	0.1.2	4.64	62.09	66.73	OK	
r-release-macos-arm64	0.1.2			34.00	OK	
r-release-macos-x86_64	0.1.2			41.00	OK	
r-release-windows-x86_64	0.1.2	24.00	113.00	137.00	OK	
r-oldrel-macos-arm64	0.1.2			29.00	OK	
r-oldrel-macos-x86_64	0.1.2			42.00	OK	
r-oldrel-windows-ix86+x86_64	0.1.2	11.00	79.00	90.00	OK	

What happened next?

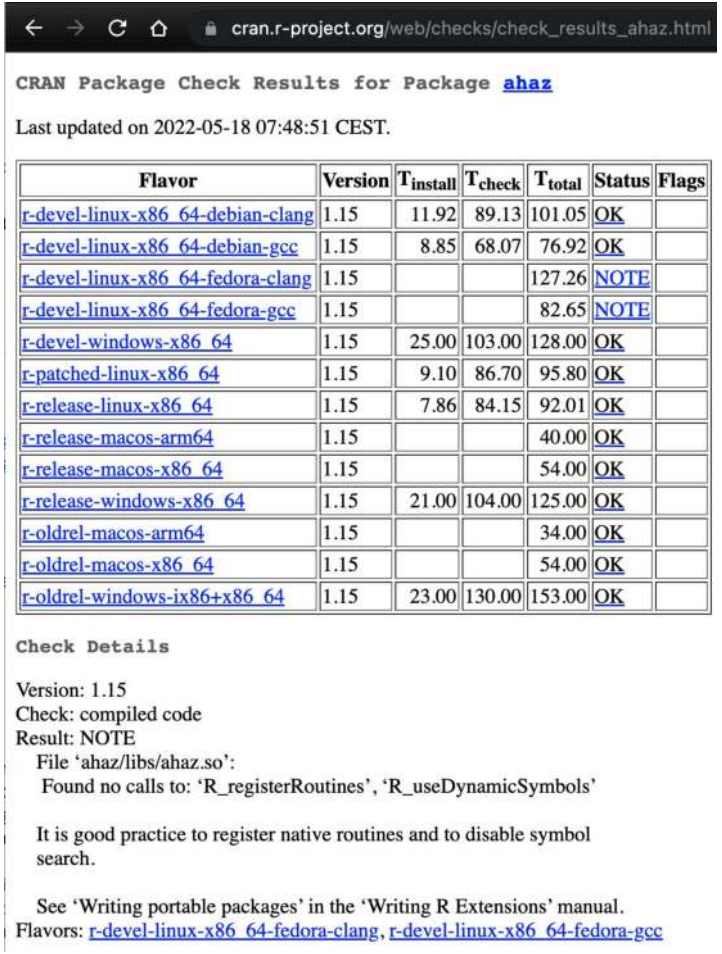
- ahaz was updated

What was the fix in the ahaz package?

- Want to see diff in source code between v1.14 and v1.15
- But ahaz is not on GitHub/other source control site from the author
- Could make own Git/GitHub repo from CRAN sources (i.e., download .tar.gz files)
- Use R-hub unofficial CRAN mirror (/compare repo page)
- https://github.com/cran/ahaz/compare
- Compare tags v1.14 to v1.15
- Git/GitHub has 2 and 3 dot syntax
- https://github.com/cran/ahaz/compare/1.14...1.15



- ahaz now reports either ok or a check note



cran.r-project.org/web/checks/check_results_ahaz.html

CRAN Package Check Results for Package ahaz

Last updated on 2022-05-18 07:48:51 CEST.

Flavor	Version	$T_{install}$	T_{check}	T_{total}	Status	Flags
r-devel-linux-x86_64-debian-clang	1.15	11.92	89.13	101.05	OK	
r-devel-linux-x86_64-debian-gcc	1.15	8.85	68.07	76.92	OK	
r-devel-linux-x86_64-fedora-clang	1.15			127.26	NOTE	
r-devel-linux-x86_64-fedora-gcc	1.15			82.65	NOTE	
r-devel-windows-x86_64	1.15	25.00	103.00	128.00	OK	
r-patched-linux-x86_64	1.15	9.10	86.70	95.80	OK	
r-release-linux-x86_64	1.15	7.86	84.15	92.01	OK	
r-release-macos-arm64	1.15			40.00	OK	
r-release-macos-x86_64	1.15			54.00	OK	
r-release-windows-x86_64	1.15	21.00	104.00	125.00	OK	
r-oldrel-macos-arm64	1.15			34.00	OK	
r-oldrel-macos-x86_64	1.15			54.00	OK	
r-oldrel-windows-ix86+x86_64	1.15	23.00	130.00	153.00	OK	

Check Details

Version: 1.15
Check: compiled code
Result: NOTE
File 'ahaz/libs/ahaz.so':
Found no calls to: 'R_registerRoutines', 'R_useDynamicSymbols'

It is good practice to register native routines and to disable symbol search.

See 'Writing portable packages' in the 'Writing R Extensions' manual.
Flavors: r-devel-linux-x86_64-fedora-clang, r-devel-linux-x86_64-fedora-gcc

- ivtools now reports ok

CRAN Package Check Results for Package **ivtools**

Last updated on 2022-05-18 07:49:00 CEST.

Flavor	Version	$T_{install}$	T_{check}	T_{total}	Status	Flags
r-devel-linux-x86_64-debian-clang	2.3.0	24.21	100.52	124.73	OK	
r-devel-linux-x86_64-debian-gcc	2.3.0	19.59	74.95	94.54	OK	
r-devel-linux-x86_64-fedora-clang	2.3.0			156.50	OK	
r-devel-linux-x86_64-fedora-gcc	2.3.0			98.82	OK	
r-devel-windows-x86_64	2.3.0	31.00	126.00	157.00	OK	
r-patched-linux-x86_64	2.3.0	20.57	92.57	113.14	OK	
r-release-linux-x86_64	2.3.0	22.56	93.44	116.00	OK	
r-release-macos-arm64	2.3.0			41.00	OK	
r-release-macos-x86_64	2.3.0			57.00	OK	
r-release-windows-x86_64	2.3.0	29.00	125.00	154.00	OK	
r-oldrel-macos-arm64	2.3.0			51.00	OK	
r-oldrel-macos-x86_64	2.3.0			74.00	OK	
r-oldrel-windows-ix86+x86_64	2.3.0	61.00	152.00	213.00	OK	

- TODO: Could put ivtools back in OneSampleMR
  - being more careful to remember to use conditionally in every case
  - the vignette build should not have failed
  - https://r-pkgs.org/description.html#guarding-the-use-of-a-suggested-package

8.1.1 Guarding the use of a suggested package

Inside a function in your own package, check for the availability of a suggested package with `requireNamespace("pkg", quietly = TRUE)`. There are two basic scenarios:

```
# the suggested package is required
my_fun <- function(a, b) {
  if (!requireNamespace("pkg", quietly = TRUE)) {
    stop(
      "Package \"pkg\" must be installed to use this function.",
      call. = FALSE
    )
  }
  # code that includes calls such as pkg::f()
}

# the suggested package is optional; a fallback method is available
my_fun <- function(a, b) {
  if (requireNamespace("pkg", quietly = TRUE)) {
    pkg::f()
  } else {
    g()
  }
}
```

Conclusion

- Your package can be removed from/archived on CRAN because of a problem with one of its dependency packages … which feels like it's not really *your fault*!
- Advice: include as few packages as possible in your Imports and Suggests lists