main

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1 Cell deconvolution comparison and quality control

Performed by Louise Huuki

```
[1]: library(tidyverse)
     library(ggpubr)
```

```
  Attaching packages                              tidyverse
1.3.1

  ggplot2 3.3.5        purrr   0.3.4
  tibble  3.1.2        dplyr   1.0.7
  tidyr   1.1.3        stringr 1.4.0
  readr   1.4.0        forcats 0.5.1

  Conflicts
tidyverse_conflicts()
  dplyr::filter() masks stats::filter()
  dplyr::lag()    masks stats::lag()
```

1.1 Functions

```
[2]: get_pheno <- function(){
         df = data.table::fread("../../../input/phenotypes/merged/_m/
     ↪merged_phenotypes.csv") %>%
             filter(Dx %in% c("Control"), Age > 17, Race %in% c("AA", "CAUC")) %>%
             mutate(Race = gsub("CAUC", "EA", Race)) %>% select(-V1)
         return(df)
     }

     memPHENO <- memoise::memoise(get_pheno)

     save_img <- function(image, fn, w, h){
         for(ext in c(".svg", ".pdf", ".png")){
             ggsave(file=paste0(fn, ext), plot=image, width=w, height=h)
         }
     }
```

1.2 Prepare data

```
[3]: load("../../_m/est_prop_Bisque.Rdata", verbose = TRUE)
     names(est_prop_bisque)
```

```
Loading objects:
  est_prop_bisque
```

1. 'dg' 2. 'caudate' 3. 'hippo' 4. 'dlpfc'

```
[4]: cc = est_prop_bisque$caudate$Est.prop.long %>%
         inner_join(memPHENO(), by=c("sample"="RNum")) %>%
         mutate_if(is.character, as.factor) %>%
         rename("Proportion"="prop") %>% mutate(Tissue="Caudate")
     dd = est_prop_bisque$dlpfc$Est.prop.long %>%
         inner_join(memPHENO(), by=c("sample"="RNum")) %>%
         mutate_if(is.character, as.factor) %>%
         rename("Proportion"="prop") %>% mutate(Tissue="DLPFC")
     hh = est_prop_bisque$hippo$Est.prop.long %>%
         inner_join(memPHENO(), by=c("sample"="RNum")) %>%
         mutate_if(is.character, as.factor) %>%
         rename("Proportion"="prop") %>% mutate(Tissue="Hippocampus")
     gg = est_prop_bisque$dg$Est.prop.long %>%
         separate(sample, c("sample", "batch")) %>%
         inner_join(memPHENO(), by=c("sample"="RNum")) %>%
         mutate_if(is.character, as.factor) %>%
         rename("Proportion"="prop") %>% mutate(Tissue="Dentate Gyrus")

     df = bind_rows(cc, dd, hh, gg)
     df %>% head(2)
```
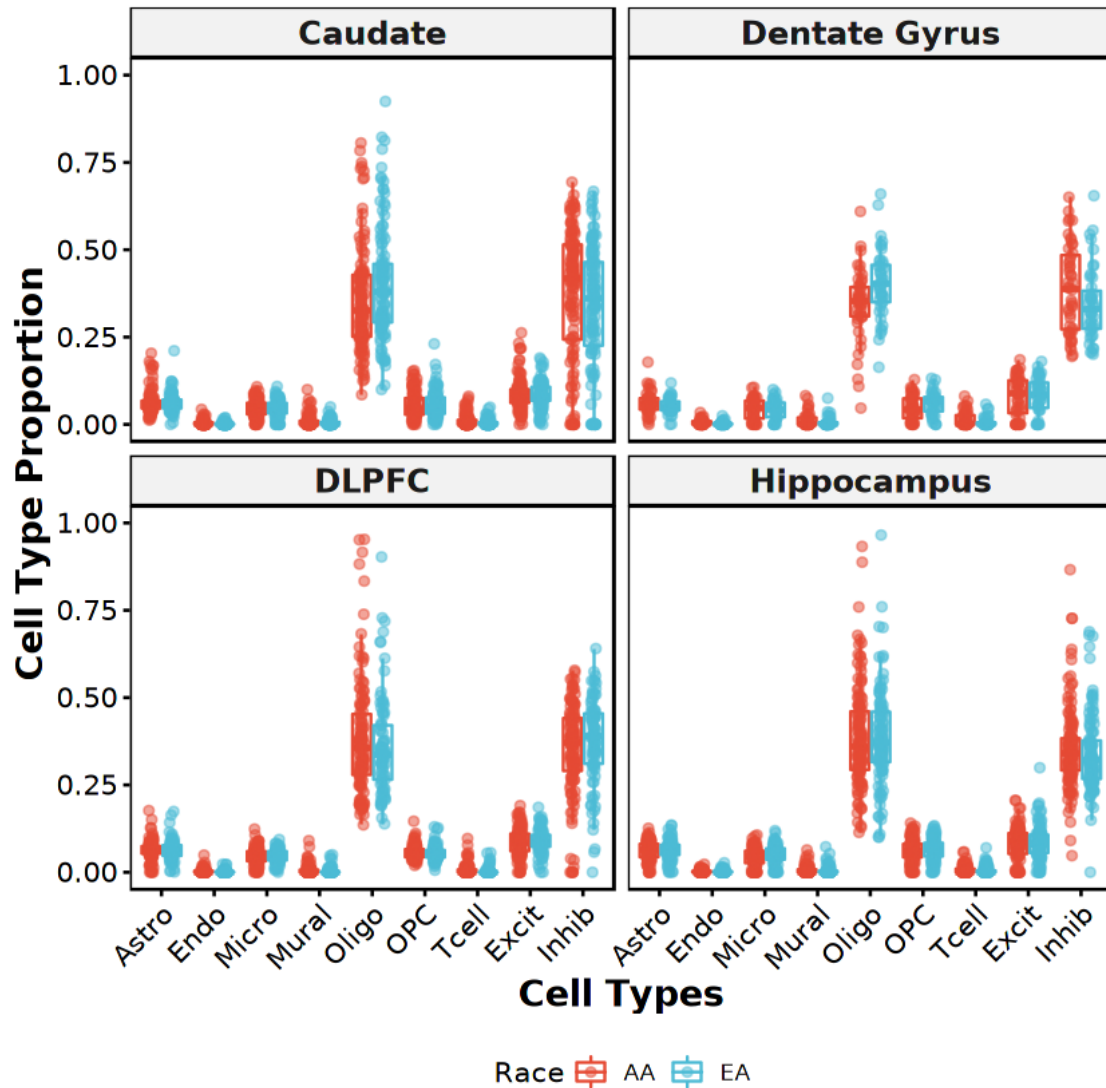
A data.frame: 2 × 15

	sample	cell_type	Proportion	BrNum	Region	RIN	Age	Sex	Rac
	<fct>	<fct>	<dbl>	<fct>	<fct>	<dbl>	<dbl>	<fct>	<fct
1	R12872	Astro	0.05623176	Br949	Caudate	9.2	18.05	M	AA
2	R12873	Astro	0.05681726	Br991	Caudate	9.4	35.24	M	AA

1.3 Cell type proportion plots

```
[5]: bxp = df %>% ggboxplot(x="cell_type", y="Proportion", color="Race", facet.
     ↪by="Tissue",
                    panel.labs.font=list(face='bold', size = 14), palette="npg",
                    outlier.shape=NA, ylab='Cell Type Proportion', add='jitter',
                    add.params=list(alpha=0.5), ylim=c(0, 1), xlab="Cell Types",
                        legend="bottom") +
         font("xy.text", size=12) + font("xy.title", size=16, face="bold") +
         rotate_x_text(45)
     print(bxp)
     save_img(bxp, paste0("boxplot_celltypes_ancestry"), w=7, h=6)
```

```
[6]: for(tissue in c("Caudate", "DLPFC", "Hippocampus", "Dentate Gyrus")){
         bxp = df %>% filter(Tissue == tissue) %>%
             ggboxplot(x="Race", y="Proportion", color="Race", facet.by="cell_type",
                      panel.labs.font=list(face='bold', size = 14), palette="npg",
                      outlier.shape=NA, ylab='Cell Type Proportion', add='jitter',
                      add.params=list(alpha=0.5), ylim=c(0, 1.2), ncol=3,
                      xlab="Ancestry", legend="None") +
             stat_compare_means(comparisons=list(c("AA", "EA")), aes(label=..p.
     ↪signif..),
                               method="t.test") +
             font("xy.text", size=12) + font("xy.title", size=16, face="bold")
         print(bxp)
         fn = paste0("boxplot_ancestryBYcelltype_",gsub(" ", "_", tolower(tissue)))
```
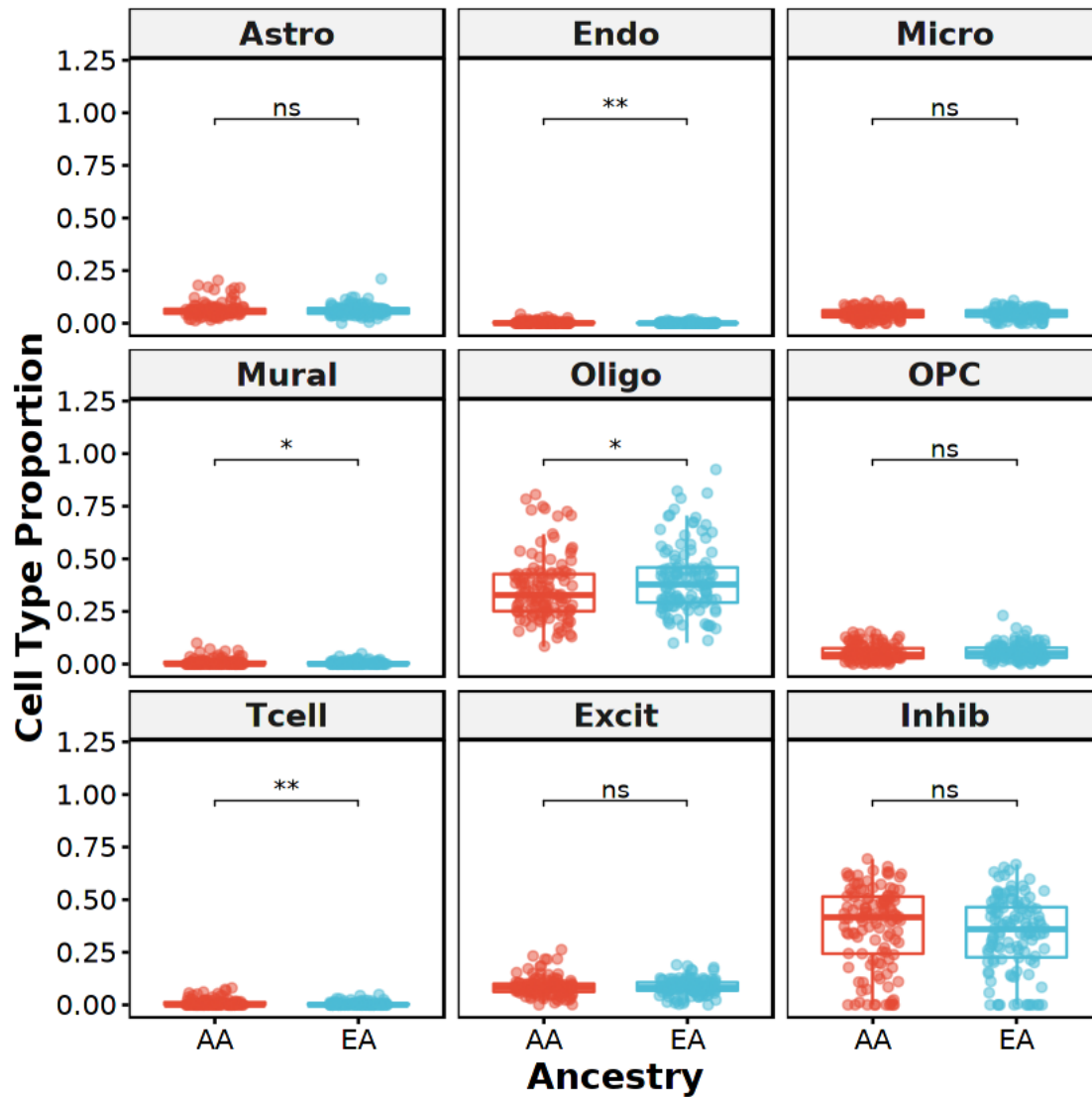
```
    save_img(bxp, fn, w=7, h=6)
}
```
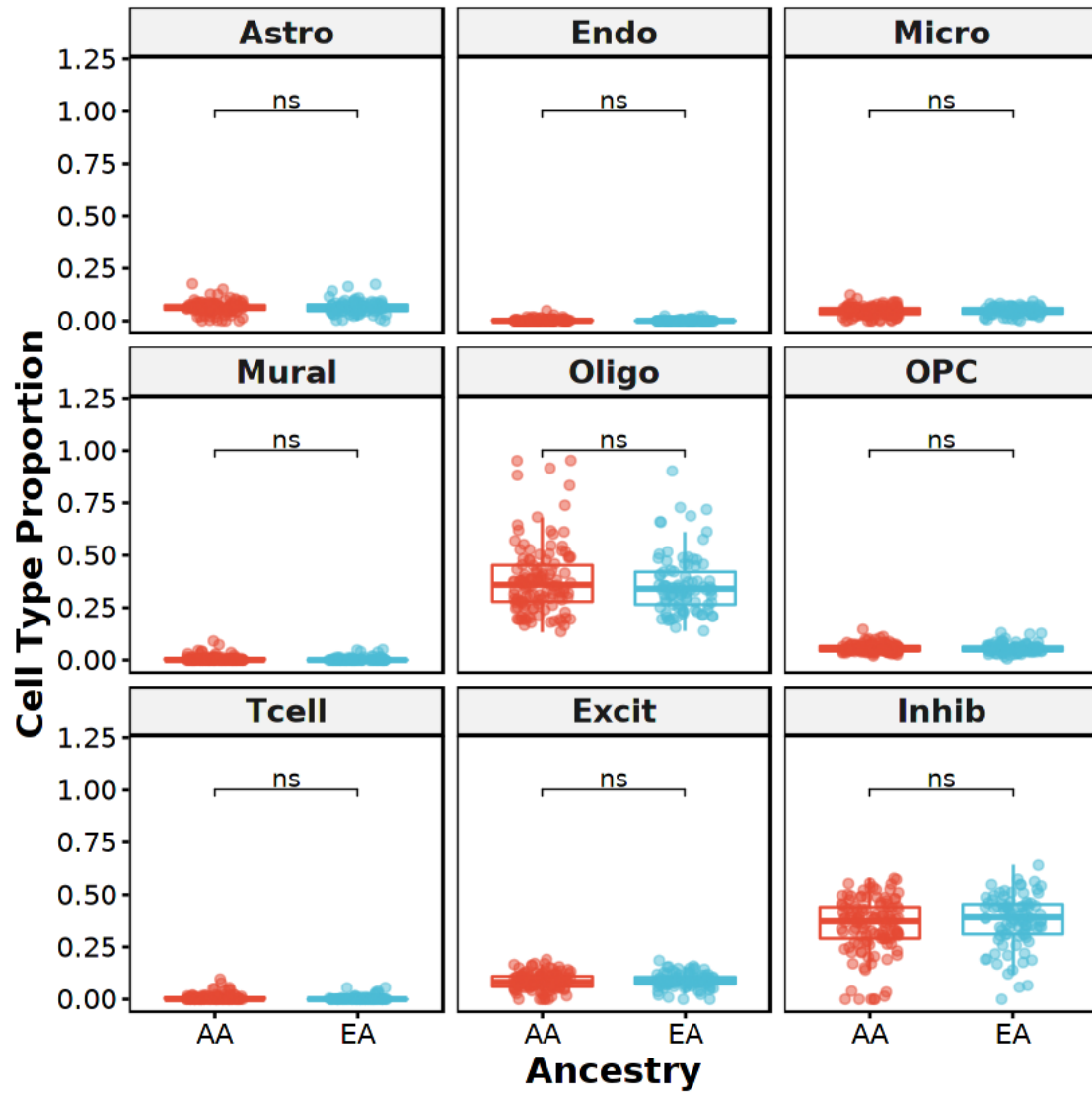
Warning message:
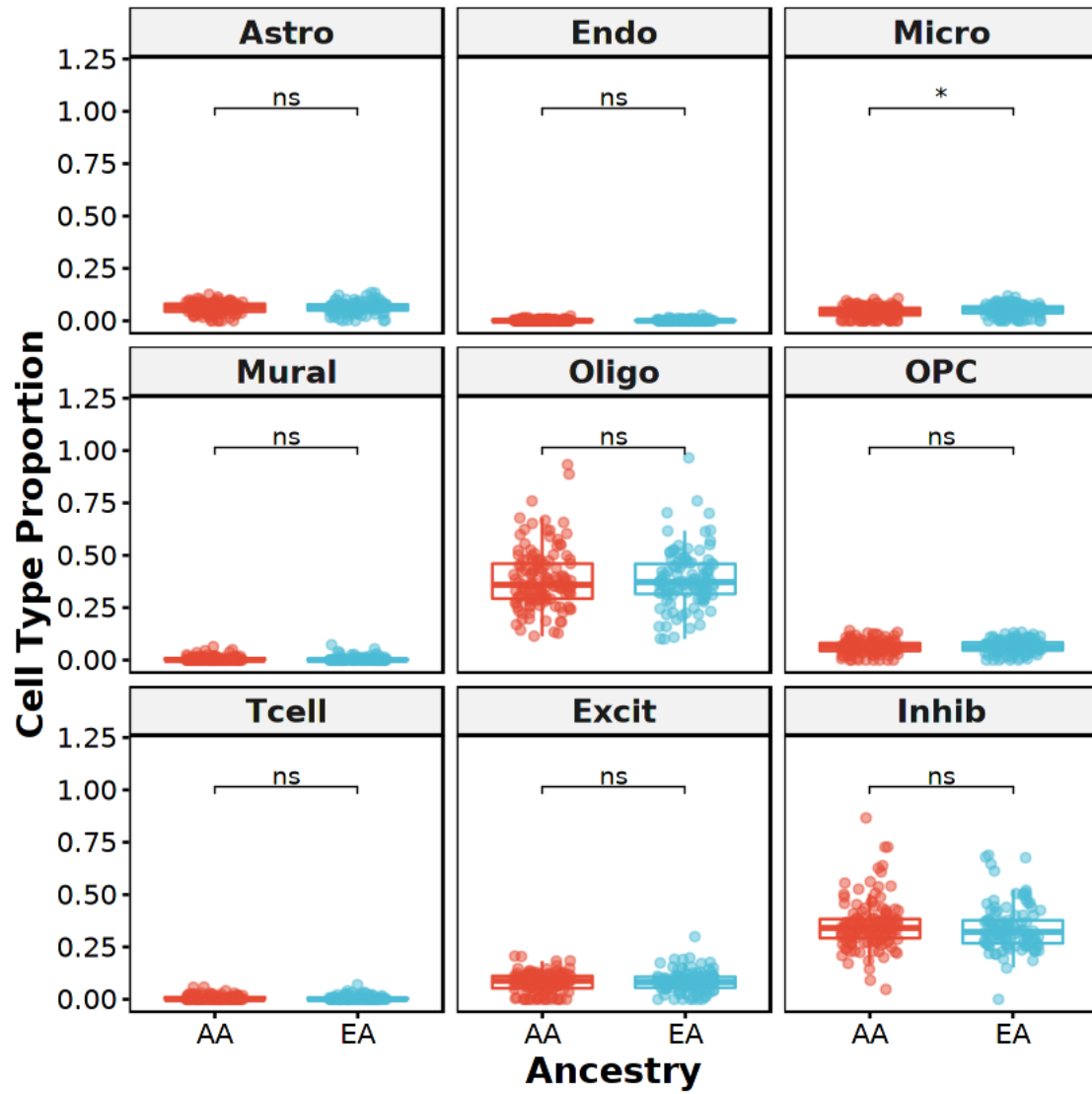"Using `as.character()` on a quosure is deprecated as of rlang 0.3.0.
Please use `as_label()` or `as_name()` instead.
This warning is displayed once per session."

1.4 Reproducibility Information

```
[7]: Sys.time()
     proc.time()
     options(width = 120)
     sessioninfo::session_info()
```

```
[1] "2021-07-22 09:09:47 EDT"

    user  system elapsed
  44.741   1.581  45.318

 Session info
 setting   value
```

```
version   R version 4.0.3 (2020-10-10)
os        Arch Linux
system    x86_64, linux-gnu
ui        X11
language  (EN)
collate   en_US.UTF-8
ctype     en_US.UTF-8
tz        America/New_York
date      2021-07-22

 Packages
package      * version  date        lib source
abind          1.4-5    2016-07-21 [1] CRAN (R 4.0.2)
assertthat     0.2.1    2019-03-21 [1] CRAN (R 4.0.2)
backports      1.2.1    2020-12-09 [1] CRAN (R 4.0.2)
base64enc      0.1-3    2015-07-28 [1] CRAN (R 4.0.2)
broom          0.7.8    2021-06-24 [1] CRAN (R 4.0.3)
cachem         1.0.5    2021-05-15 [1] CRAN (R 4.0.3)
Cairo          1.5-12.2 2020-07-07 [1] CRAN (R 4.0.2)
car            3.0-11   2021-06-27 [1] CRAN (R 4.0.3)
carData        3.0-4    2020-05-22 [1] CRAN (R 4.0.2)
cellranger     1.1.0    2016-07-27 [1] CRAN (R 4.0.2)
cli            3.0.0    2021-06-30 [1] CRAN (R 4.0.3)
colorspace     2.0-2    2021-06-24 [1] CRAN (R 4.0.3)
crayon         1.4.1    2021-02-08 [1] CRAN (R 4.0.3)
curl           4.3.2    2021-06-23 [1] CRAN (R 4.0.3)
data.table     1.14.0   2021-02-21 [1] CRAN (R 4.0.3)
DBI            1.1.1    2021-01-15 [1] CRAN (R 4.0.2)
dbplyr         2.1.1    2021-04-06 [1] CRAN (R 4.0.3)
digest         0.6.27   2020-10-24 [1] CRAN (R 4.0.2)
dplyr        * 1.0.7    2021-06-18 [1] CRAN (R 4.0.3)
ellipsis       0.3.2    2021-04-29 [1] CRAN (R 4.0.3)
evaluate       0.14     2019-05-28 [1] CRAN (R 4.0.2)
fansi          0.5.0    2021-05-25 [1] CRAN (R 4.0.3)
farver         2.1.0    2021-02-28 [1] CRAN (R 4.0.3)
fastmap        1.1.0    2021-01-25 [1] CRAN (R 4.0.2)
forcats      * 0.5.1    2021-01-27 [1] CRAN (R 4.0.2)
foreign        0.8-80   2020-05-24 [2] CRAN (R 4.0.3)
fs             1.5.0    2020-07-31 [1] CRAN (R 4.0.2)
generics       0.1.0    2020-10-31 [1] CRAN (R 4.0.2)
ggplot2      * 3.3.5    2021-06-25 [1] CRAN (R 4.0.3)
ggpubr       * 0.4.0    2020-06-27 [1] CRAN (R 4.0.2)
ggsci          2.9      2018-05-14 [1] CRAN (R 4.0.2)
ggsignif       0.6.2    2021-06-14 [1] CRAN (R 4.0.3)
glue           1.4.2    2020-08-27 [1] CRAN (R 4.0.2)
gtable         0.3.0    2019-03-25 [1] CRAN (R 4.0.2)
haven          2.4.1    2021-04-23 [1] CRAN (R 4.0.3)
hms            1.1.0    2021-05-17 [1] CRAN (R 4.0.3)
```

```
htmltools      0.5.1.1   2021-01-22 [1] CRAN (R 4.0.2)
httr           1.4.2     2020-07-20 [1] CRAN (R 4.0.2)
IRdisplay      1.0       2021-01-20 [1] CRAN (R 4.0.2)
IRkernel       1.2       2021-05-11 [1] CRAN (R 4.0.3)
jsonlite       1.7.2     2020-12-09 [1] CRAN (R 4.0.2)
labeling       0.4.2     2020-10-20 [1] CRAN (R 4.0.2)
lifecycle      1.0.0     2021-02-15 [1] CRAN (R 4.0.3)
lubridate      1.7.10    2021-02-26 [1] CRAN (R 4.0.3)
magrittr       2.0.1     2020-11-17 [1] CRAN (R 4.0.2)
memoise        2.0.0     2021-01-26 [1] CRAN (R 4.0.2)
modelr         0.1.8     2020-05-19 [1] CRAN (R 4.0.2)
munsell        0.5.0     2018-06-12 [1] CRAN (R 4.0.2)
openxlsx       4.2.4     2021-06-16 [1] CRAN (R 4.0.3)
pbdZMQ         0.3-5     2021-02-10 [1] CRAN (R 4.0.3)
pillar         1.6.1     2021-05-16 [1] CRAN (R 4.0.3)
pkgconfig      2.0.3     2019-09-22 [1] CRAN (R 4.0.2)
purrr        * 0.3.4     2020-04-17 [1] CRAN (R 4.0.2)
R6             2.5.0     2020-10-28 [1] CRAN (R 4.0.2)
Rcpp           1.0.7     2021-07-07 [1] CRAN (R 4.0.3)
readr        * 1.4.0     2020-10-05 [1] CRAN (R 4.0.2)
readxl         1.3.1     2019-03-13 [1] CRAN (R 4.0.2)
repr           1.1.3     2021-01-21 [1] CRAN (R 4.0.2)
reprex         2.0.0     2021-04-02 [1] CRAN (R 4.0.3)
rio            0.5.27    2021-06-21 [1] CRAN (R 4.0.3)
rlang          0.4.11    2021-04-30 [1] CRAN (R 4.0.3)
rstatix        0.7.0     2021-02-13 [1] CRAN (R 4.0.3)
rstudioapi     0.13      2020-11-12 [1] CRAN (R 4.0.2)
rvest          1.0.0     2021-03-09 [1] CRAN (R 4.0.3)
scales         1.1.1     2020-05-11 [1] CRAN (R 4.0.2)
sessioninfo    1.1.1     2018-11-05 [1] CRAN (R 4.0.2)
stringi        1.7.3     2021-07-16 [1] CRAN (R 4.0.3)
stringr      * 1.4.0     2019-02-10 [1] CRAN (R 4.0.2)
svglite        2.0.0     2021-02-20 [1] CRAN (R 4.0.3)
systemfonts    1.0.2     2021-05-11 [1] CRAN (R 4.0.3)
tibble       * 3.1.2     2021-05-16 [1] CRAN (R 4.0.3)
tidyr        * 1.1.3     2021-03-03 [1] CRAN (R 4.0.3)
tidyselect     1.1.1     2021-04-30 [1] CRAN (R 4.0.3)
tidyverse    * 1.3.1     2021-04-15 [1] CRAN (R 4.0.3)
utf8           1.2.1     2021-03-12 [1] CRAN (R 4.0.3)
uuid           0.1-4     2020-02-26 [1] CRAN (R 4.0.2)
vctrs          0.3.8     2021-04-29 [1] CRAN (R 4.0.3)
withr          2.4.2     2021-04-18 [1] CRAN (R 4.0.3)
xml2           1.3.2     2020-04-23 [1] CRAN (R 4.0.2)
zip            2.2.0     2021-05-31 [1] CRAN (R 4.0.3)

[1] /home/jbenja13/R/x86_64-pc-linux-gnu-library/4.0
[2] /usr/lib/R/library
```