Gene Expression Variation Analysis (GEVA)

Nunes IJG, David MZ, Feltes BC, and Dorn M

January 20, 2021

Contents

1 Introduction

`GEVA` is a package for the analysis of differential gene expression in multiple experimental comparisons. It takes into account the fold-changes and p-values from previous differential expression (DE) results that use large-scale data (*e.g.*, microarray and RNA-seq) and evaluates which genes would react in response to the distinct experiments. This evaluation involves an unique pipeline of statistical methods, including weighted summarization, quantile detection, clustering, and ANOVA tests, in order to classify a subset of relevant genes whose differential expression is similar or dependent to certain biological factors.

This guide introduces the basic usage of `geva` package and its main features to perform the entire analysis from the input to the final classification. However, for more detailed specifications regarding classes, functions, and arguments from `geva`, please check the "Reference Guide" available in the GitHub repository or access the local documentation by typing `?geva` in the R console.

2 Data Input

There's already a function that does the quick start.

3 Styles

The `html_vignette` template includes a basic CSS theme. To override this theme you can specify your own CSS in the document metadata as follows:
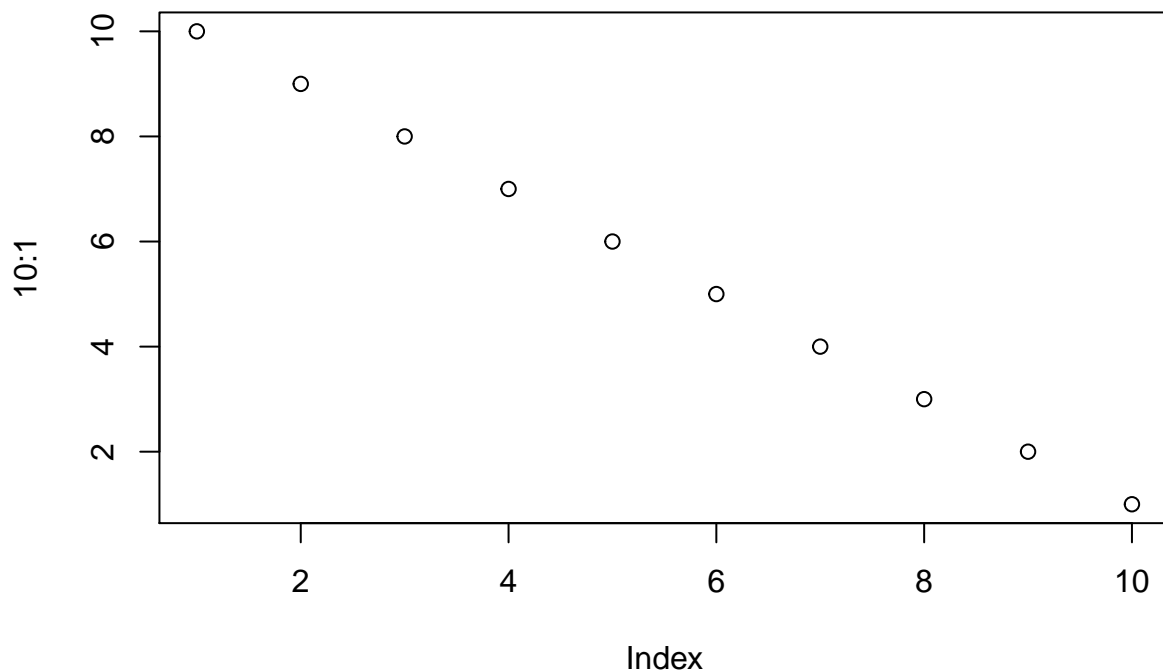
```
output:
  rmarkdown::html_vignette:
    css: mystyles.css
```

4 Figures

The figure sizes have been customised so that you can easily put two images side-by-side.

```
plot(1:10)
plot(10:1)
```
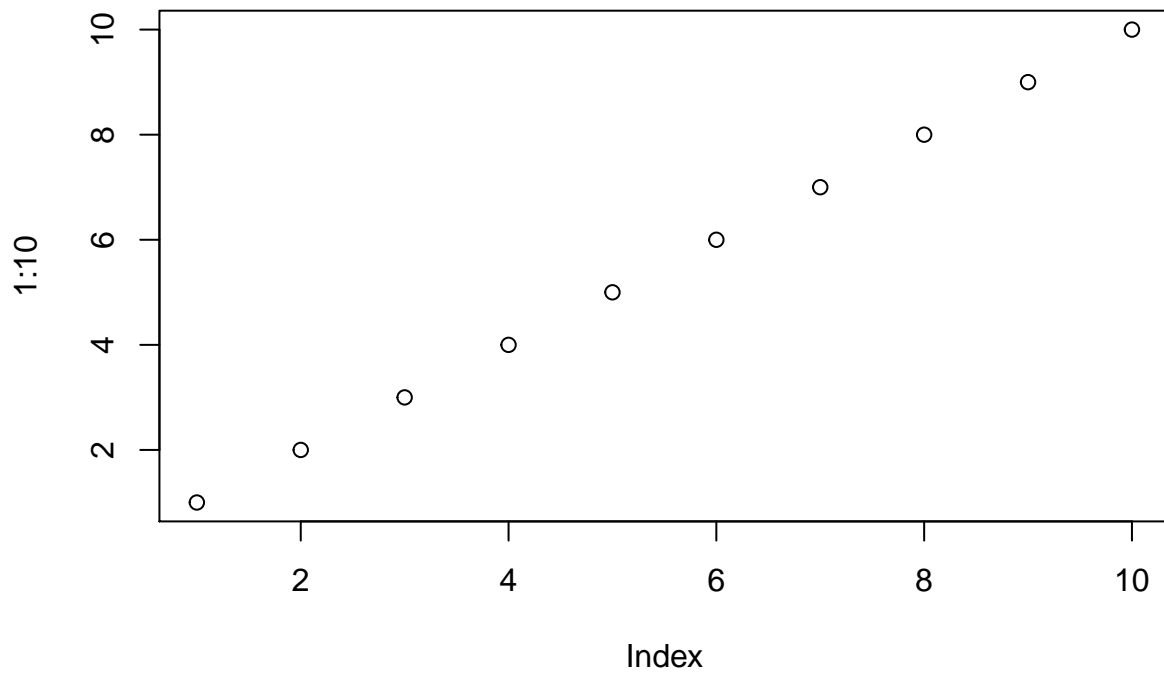
You can enable figure captions by `fig_caption: yes` in YAML:

```
output:
  rmarkdown::html_vignette:
    fig_caption: yes
```

Then you can use the chunk option `fig.cap = "Your figure caption."` in **knitr**.

4.1 More Examples

You can write math expressions, e.g. $Y = X\beta + \epsilon$, footnotes[1], and tables, e.g. using `knitr::kable()`.

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1	0	3	1
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1	0	4	2
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1	0	4	2
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4

Also a quote using `>`:

---

[1] A footnote here.

"He who gives up [code] safety for [code] speed deserves neither." (via)