Brainconductor demo

Setting up

We first install the relevant packages, `brcbase` (which contains the core code needed for this demo) and `brcdata` (which contains the example datasets).

```
library(devtools)
devtools::install_github("cdgreenidge/brcbase", ref = "kevin", subdir = "brcbase")
```

```
## Skipping install of 'brcbase' from a github remote, the SHA1 (b0d1ed54) has not changed since last i
##   Use `force = TRUE` to force installation
```

```
devtools::install_github("linnylin92/brcdata", ref = "kevin")
```

```
## Skipping install of 'brcdata' from a github remote, the SHA1 (bd32bc5e) has not changed since last i
##   Use `force = TRUE` to force installation
```

Basics of `brcbase`

Let us investigate first `COBRE_0040071_funcSeg`, the functional MRI scan of subject 0040071 in the COBRE repository. We can look up more information on this dataset using `?COBRE_0040071_funcSeg`

```
library(brcbase)
library(brcdata)
dat <- brcdata::COBRE_0040071_funcSeg
class(dat)
```

```
## [1] "BrcFmri"
```

```
dat
```

```
## BrcFmri object of dimension 61 x 73 x 61
##  with 82470 parcels and 5 length
## ----------
##
## $data2d (Abridged)
##          [,1]     [,2]     [,3]     [,4]     [,5]     [,6]     [,7]
## [1,] 30.02991 174.8699 356.7232 511.1431 576.2834 685.0399 769.8184
## [2,] 27.63441 160.8071 332.9987 471.9348 510.8638 609.2991 666.3053
## [3,] 32.30598 188.1584 356.6695 494.9095 552.8895 656.2498 736.8334
## [4,] 29.51525 171.8208 340.1711 482.5676 545.7252 678.8959 761.8602
## [5,] 28.45482 165.5816 329.9427 463.3896 508.2646 623.3168 684.4691
##          [,8]     [,9]    [,10]
## [1,] 812.0490 725.7983 373.0438
## [2,] 673.5076 615.9930 319.4124
## [3,] 782.1230 738.2408 387.2846
## [4,] 781.6453 720.3726 374.6099
## [5,] 680.3885 594.5089 302.8029
##
## $id
## [1] "COBRE_0040071"
##
## $parcellation (Object of class BrcParcellation)
```

```
## $$dim3d
## [1] 61 73 61
##
## $$partition (Abridged)
##  [1] 0 0 0 0 0 0 0 0 0 0
```

We see some distinctive components of `dat`, an object of the `BrcFmri` class. These are `data2d`, `id`, and `parcellation`.

```
names(dat)
```

```
## [1] "data2d"       "id"           "parcellation"
```

The first component is `data2d`. In our case, this is a 5×82470 matrix, where each column represents a different time index and each row represents a different voxel. We call this the "2d" representation since it ignores spatial information, as it is unclear a priori which voxels neighbor which voxels.