ddsPLS Exploration

Harpeth Lee

2/4/2022

```
library(ddsPLS2)
```

```
ddsPLS2::ddsPLS2_App()
```

This code chunk opens an applet that can be used to build models using ddsPLS. Note that it requires the X and Y variables as separate csv files.

Code copied from the simulation_ssdpls2 repository created by Hadrien Lorenzo.

```
# Creates a toy data set for the ddsPLS function
toy_ex <- get_toy_example()
```

```
# Creates model from the toy data
toy_mod <- ddsPLS(toy_ex$X, toy_ex$Y)

toy_results <- toy_mod$results
```

Recreate Toy Example

This is a recreation of the toy example created by Hadrien Lorenzo, the original example can be found here.

```
# Creates toy data set to be used
simu_toy <- get_toy_example(n=50,sqrt_1_minus_sig2 = 0.9025,p = 1000)

# Creates vector of lambda values to be used
lambdas <- seq(0,1,length.out = 30)

# Sets number of bootstrap samples to run
n_B <- 100

# Creates model using ddsPLS algorithm
model_toy <- ddsPLS(simu_toy$X,simu_toy$Y,
                    doBoot = FALSE,
                    lambdas = lambdas,
                    n_B = n_B,
                    verbose = T # whether trace during process
                    )
```

```
model_toy_2 <- ddsPLS(simu_toy$X,simu_toy$Y,
                      doBoot = FALSE,
                    criterion = "Q2",
                     lambdas = lambdas,
                     n_B = n_B,
                     verbose = T # whether trace during process
                     )
```

Design 1

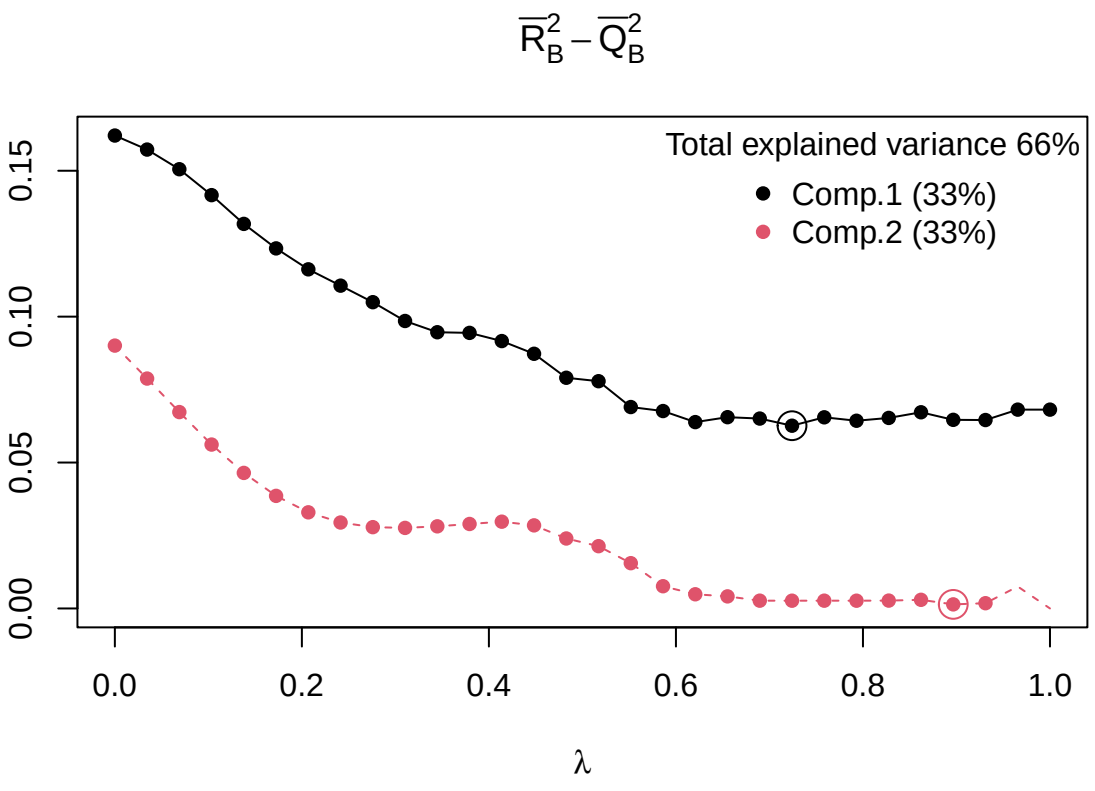
```
simu_1 <- get_design_1(n=50,sqrt_1_minus_sig2 = 0.99,p = 1000,q = 3)
```

What does the NCORES argument do? Setting it to integers greater than 1 gives an error.

Is there a way to include more components in the model?

```
model_1 <- ddsPLS(simu_1$X,simu_1$Y,
                  lambdas = lambdas,
                  n_B=n_B,
                  verbose=T)
```

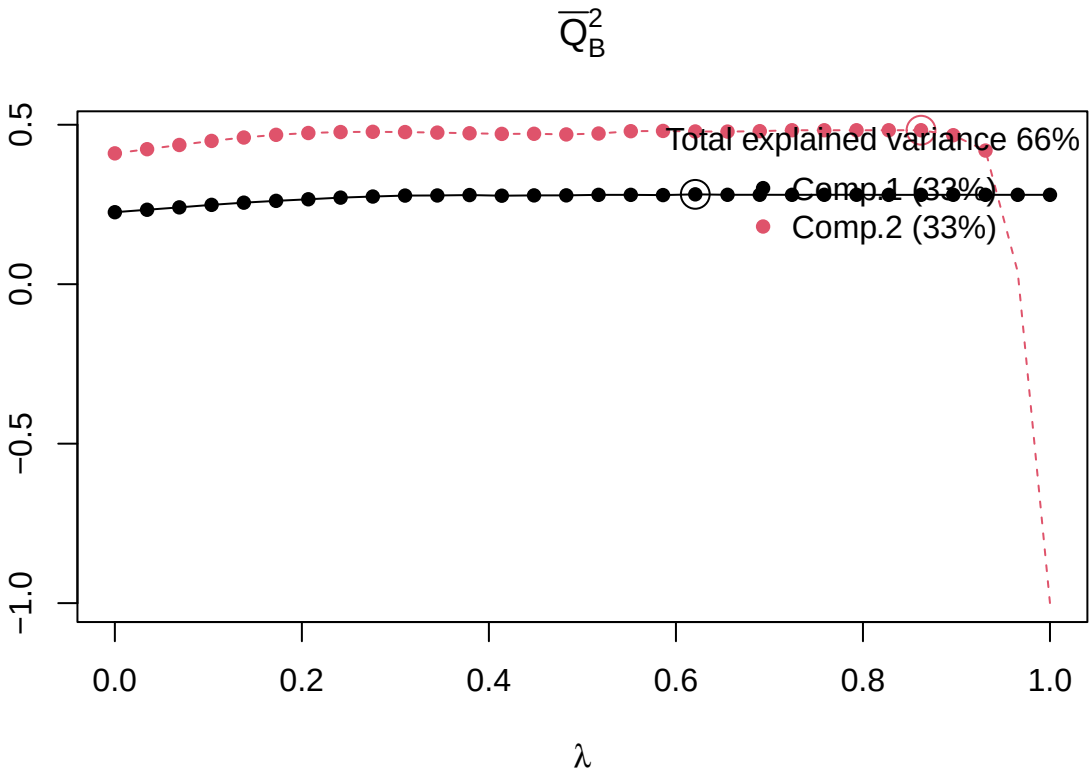
```
##                       --------------
##                      |    ddsPLS    |
## =====================|--------------|=====================
## Should we build component 1 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.72 0.34 0.34 0.28 0.28     33%         33%
##                                      ...component 1 built!
## Should we build component 2 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##         0.9 0.59 0.25 0.59 0.46     33%         66%
##                                      ...component 2 built!
## Should we build component 3 ? Bootstrap pending...
##                                   ...component 3 not built!
## ====================               ====================
##                      ================
```




```
model_1_Q2 <- ddsPLS(simu_1$X,simu_1$Y,
                  criterion = "Q2",
```

```
                  lambdas = lambdas,
                  n_B=n_B,
                  verbose=T)
```

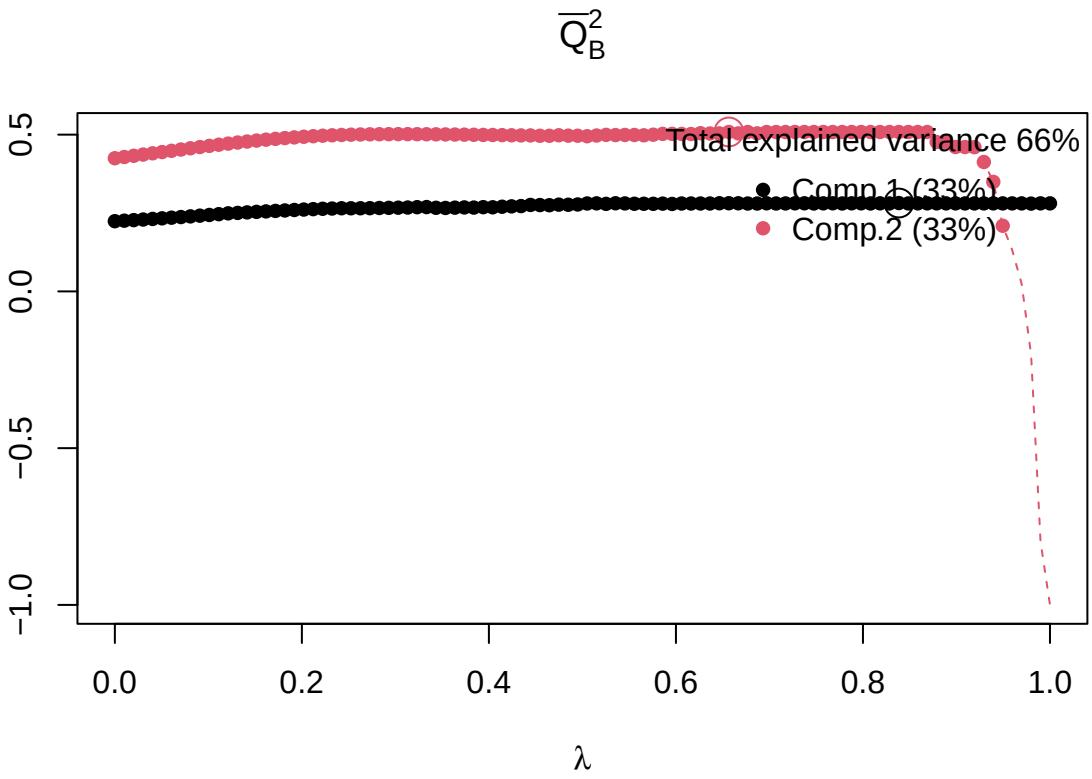
```
##                       --------------
##                      |    ddsPLS    |
## =====================--------------=====================
## Should we build component 1 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.62 0.35 0.35 0.28 0.28     33%         33%
##                                      ...component 1 built!
## Should we build component 2 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.86 0.64 0.29 0.63 0.48     33%         66%
##                                      ...component 2 built!
## Should we build component 3 ? Bootstrap pending...
##                                    ...component 3 not built!
## =====================                ======================
##                       ================
```




```
model_1_lambda <- ddsPLS(simu_1$X, simu_1$Y,
                         criterion = "Q2",
                         lambdas = seq(0,1,length.out = 100),
                         n_B = n_B,
                         verbose = T)
```

```
##                       --------------
##                      |    ddsPLS    |
## =====================--------------=====================
## Should we build component 1 ? Bootstrap pending...
```

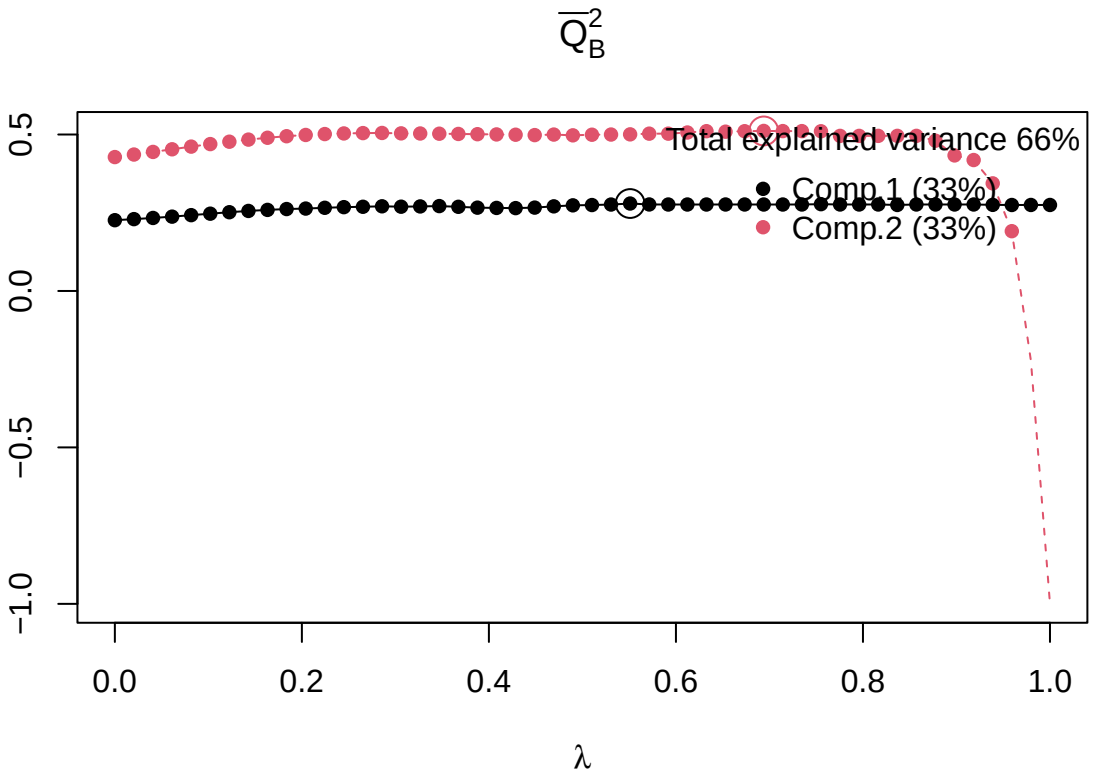
```
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.84 0.35 0.35 0.28 0.28     33%         33%
##                                     ...component 1 built!
## Should we build component 2 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.66 0.64 0.29 0.64 0.51     33%         66%
##                                     ...component 2 built!
## Should we build component 3 ? Bootstrap pending...
##                                  ...component 3 not built!
## ====================                ====================
##                       ================
```




```
model_1_lambda_2 <- ddsPLS(simu_1$X, simu_1$Y,
                           criterion = "Q2",
                           lambdas = seq(0,1,length.out = 50),
                           n_B = n_B,
                           verbose = T)
```

```
##                           --------------
##                          |    ddsPLS    |
## ====================-----------------====================
## Should we build component 1 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.55 0.35 0.35 0.28 0.28     33%         33%
##                                     ...component 1 built!
## Should we build component 2 ? Bootstrap pending...
##      lambda   R2  R2h   Q2  Q2h VarExpl VarExpl.Tot
##        0.69 0.63 0.29 0.64 0.51     33%         66%
##                                     ...component 2 built!
## Should we build component 3 ? Bootstrap pending...
```

```
##                                    ...component 3 not built!
## ====================                 ====================
##                       ================
```



Different Simulations of Design 1 Data

There is a problem with `get_design_1`, `q` cannot take values other than 5.

```
data_1 <- get_design_1(n = 100, p = 1000, q = 5)

ddsPLS(data_1$X,data_1$Y,
                   criterion = "Q2",
                   lambdas = lambdas,
                   n_B=n_B,
                   verbose=T)
```