LaTeX for bpca objects

Authors
José C. Faria,
Ivan B. Allaman

September 10, 2025

Contents

1 The simplest

```
> library(bpca)
> library(xtable)
> bp <- bpca(iris[-5])
> ## The simplest possible
> xtable(bp)
```

		Eigenvalues	
		PC1 ($\lambda_1 = 20.85$)	PC2 ($\lambda_2 = 11.67$)
Eigenvectors	Sepal.Length	0.52	-0.38
	Sepal.Width	-0.27	-0.92
	Petal.Length	0.58	-0.02
	Petal.Width	0.56	-0.07
	Variance retained	0.73	0.23
	Variance accumulated	0.73	0.96

```
> print(xtable(bp))
```

		Eigenvalues	
		PC1 ($\lambda_1 = 20.85$)	PC2 ($\lambda_2 = 11.67$)
Eigenvectors	Sepal.Length	0.52	-0.38
	Sepal.Width	-0.27	-0.92
	Petal.Length	0.58	-0.02
	Petal.Width	0.56	-0.07
	Variance retained	0.73	0.23
	Variance accumulated	0.73	0.96

2 Cross-referencing I

Using label to cross-referencing: biplot of iris data (packages:datasets) (Table 1), biplot of gabriel1971 data (package:bpca) (Table 2).

```
> ## With caption and label
> ## It will use the methods print.xtable.bpca provided by the bpca package
> xtable(bpca(iris[-5]),
+        caption='Biplot of iris data (packages:datasets).',
+        label='tbl_iris')
```

		Eigenvalues	
		PC1 ($\lambda_1 = 20.85$)	PC2 ($\lambda_2 = 11.67$)
Eigenvectors	Sepal.Length	0.52	-0.38
	Sepal.Width	-0.27	-0.92
	Petal.Length	0.58	-0.02
	Petal.Width	0.56	-0.07
	Variance retained	0.73	0.23
	Variance accumulated	0.73	0.96

Table 1: Biplot of iris data (packages:datasets).

3 Cross-referencing II

```
> ## With caption and label
> xtable(bpca(gabriel1971),
+        caption='Biplot of gabriel1971 data (package:datasets).',
+        label='tbl_gabriel')
```

		Eigenvalues	
		PC1 ($\lambda_1 = 7.63$)	PC2 ($\lambda_2 = 1.77$)
Eigenvectors	CRISTIAN	0.34	0.15
	ARMENIAN	0.34	0.17
	JEWISH	0.34	0.28
	MOSLEM	0.34	0.21
	MODERN.1	0.32	-0.58
	MODERN.2	0.31	-0.60
	OTHER.1	0.35	-0.11
	OTHER.2	0.34	0.07
	RUR	0.32	0.34
	Variance retained	0.92	0.05
	Variance accumulated	0.92	0.97

Table 2: Biplot of gabriel1971 data (package:datasets).

4 Beautify

4.1 Bold in columns

Bold in the column (Table 3).

```
> ## With bold in the columns
> bp_rock_x <- xtable(bpca(rock),
+                     caption='Biplot of rock data (package:dtasets).',
+                     label='tbl_rock')
> bold <- function(x){
+   paste('\\textbf{',
+         x,
+         '}')
+ }
> print(bp_rock_x,
+       sanitize.colnames.function = bold)
```

		Eigenvalues	
		PC1 ($\lambda_1 = 11.07$)	**PC2** ($\lambda_2 = 6.59$)
Eigenvectors	area	0.47	-0.6
	peri	0.59	-0.24
	shape	-0.39	-0.71
	perm	-0.52	-0.28
	Variance retained	0.65	0.23
	Variance accumulated	0.65	0.88

Table 3: Biplot of rock data (package:dtasets).

4.2 Italic in rows

Italic in the rows (Table 4).

```
> ## With italic in the rows
> bp_USA_x <- xtable(bpca(USArrests),
+                    caption='Biplot of USArrests data (package:datasets).',
+                    label='tbl_USArrests')
> italic <- function(x){
+   paste('\\textit{',
+         x,
+         '}',
+         sep='')
+ }
> print(bp_USA_x,
+       sanitize.rownames.function = italic)
```

		Eigenvalues	
		PC1 ($\lambda_1 = 11.02$)	PC2 ($\lambda_2 = 6.96$)
Eigenvectors	*Murder*	-0.54	-0.42
	Assault	-0.58	-0.19
	UrbanPop	-0.28	0.87
	Rape	-0.54	0.17
	Variance retained	0.62	0.25
	Variance accumulated	0.62	0.87

Table 4: Biplot of USArrests data (package:datasets).

5 Latin characters

Latin characters in the rows (Table 5).

```
> ## Principal labels in portuguese
> tbl_rock_x <- xtable(bpca(rock),
+                      caption='Biplot of rock data (package:datasets).',
+                      label='tbl_rock_2')
> rownames(tbl_rock_x) <- gsub('Eigenvalues',
+                              'Autovalores',
+                              rownames(tbl_rock_x))
> rownames(tbl_rock_x) <- gsub('Eigenvectors',
+                              'Autovetores',
+                              rownames(tbl_rock_x))
> rownames(tbl_rock_x) <- gsub('Variance retained',
+                              'Variância retida',
+                              rownames(tbl_rock_x))
> rownames(tbl_rock_x) <- gsub('Variance accumulated',
+                              'Variância acumulada',
+                              rownames(tbl_rock_x))
> colnames(tbl_rock_x) <- c('CP1',
+                           'CP2')
> print(tbl_rock_x)
```

		Autovalores	
		CP1 ($\lambda_1 = 11.07$)	CP2 ($\lambda_2 = 6.59$)
Autovetores	area	0.47	-0.6
	peri	0.59	-0.24
	shape	-0.39	-0.71
	perm	-0.52	-0.28
	Variância retida	0.65	0.23
	Variância acumulada	0.65	0.88

Table 5: Biplot of rock data (package:datasets).

6 Call print.xtable function

Call directly the print.xtable function to customize (Table 6).

```
> ## If you don't want to use the bpca formatting standard (method print.xtable.bpca),
> ## you can directly call the print.xtable function and format the table as you wish.
> italic <- function(x){
+   paste('\\textit{',
+         x,
+         '}',
+         sep='')
+ }
> print.xtable(xtable(bpca(rock),
+              caption='Call directly the print.xtable function',
+              label='tbl_directly'),
+              sanitize.colnames.function=bold,
+              sanitize.rownames.function=italic)
```

	PC1	**PC2**
Eigenvectors_area	0.47	-0.60
Eigenvectors_peri	0.59	-0.24
Eigenvectors_shape	-0.39	-0.71
Eigenvectors_perm	-0.52	-0.28
Eigenvalues	11.07	6.59
Variance retained	0.65	0.23
Variance accumulated	0.65	0.88

Table 6: Call directly the print.xtable function

```
>
> ## To others formatations see:
> ## - ?xtable
> ## - ?print.xtable
```