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# **L<sup>A</sup>T<sub>E</sub>X** for bpca objects

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# 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 ( $\lambda_2 = 6.96$ )
<i>Eigenvectors</i>	<i>Murder</i>	-0.54	-0.42
	<i>Assault</i>	-0.58	-0.19
	<i>UrbanPop</i>	-0.28	0.87
	<i>Rape</i>	-0.54	0.17
<i>Variance retained</i>		0.62	0.25
<i>Variance accumulated</i>		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)
```

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

Table 6: Call directly the print.xtable function

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