Feuille de Travaux Dirigés n° 7
Classifications

Exercice VII.1. Étude des caractéristiques d'un ensemble d'hôtels

Partie I : Classification hiérarchique ascendante

1. Récupérer les données dans **R** en exécutant les instructions suivantes. Penser à remplacer `"C :\\..."` par le répertoire dans lequel vous avez enregistré le fichier que vous souhaitez ouvrir.

```
> Chemin <- "C:\\..."
> hotels <- read.csv(paste(Chemin, "ESIEADMTD5_EX1.CSV",
+     sep = ""), row.names = 1)
```

2. Quelles sont les différentes variables reproduites dans le tableau au verso ? Quelle est leur nature ? Qui sont les individus et les variables sur qui on va faire porter la classification hiérarchique ascendante ? Obtenir les statistiques descriptives, les covariances et les corrélations entre les variables quantitatives du jeu de données. Créer ensuite le graphique en étoile des hôtels.

	PAYS	ETOILE	CONFORT	CHAMBRE
1	Grèce : 8	Min. :0.000	Min. :2.00	Min. : 50.0
2	Maroc :12	1st Qu. :2.000	1st Qu. :4.00	1st Qu. :148.0
3	Portugal : 5	Median :3.000	Median :5.00	Median :250.0
4	Tunisie :10	Mean :2.974	Mean :5.18	Mean :261.2
5	Turquie : 4	3rd Qu. :4.000	3rd Qu. :6.00	3rd Qu. :317.0
6		Max. :5.000	Max. :9.00	Max. :800.0

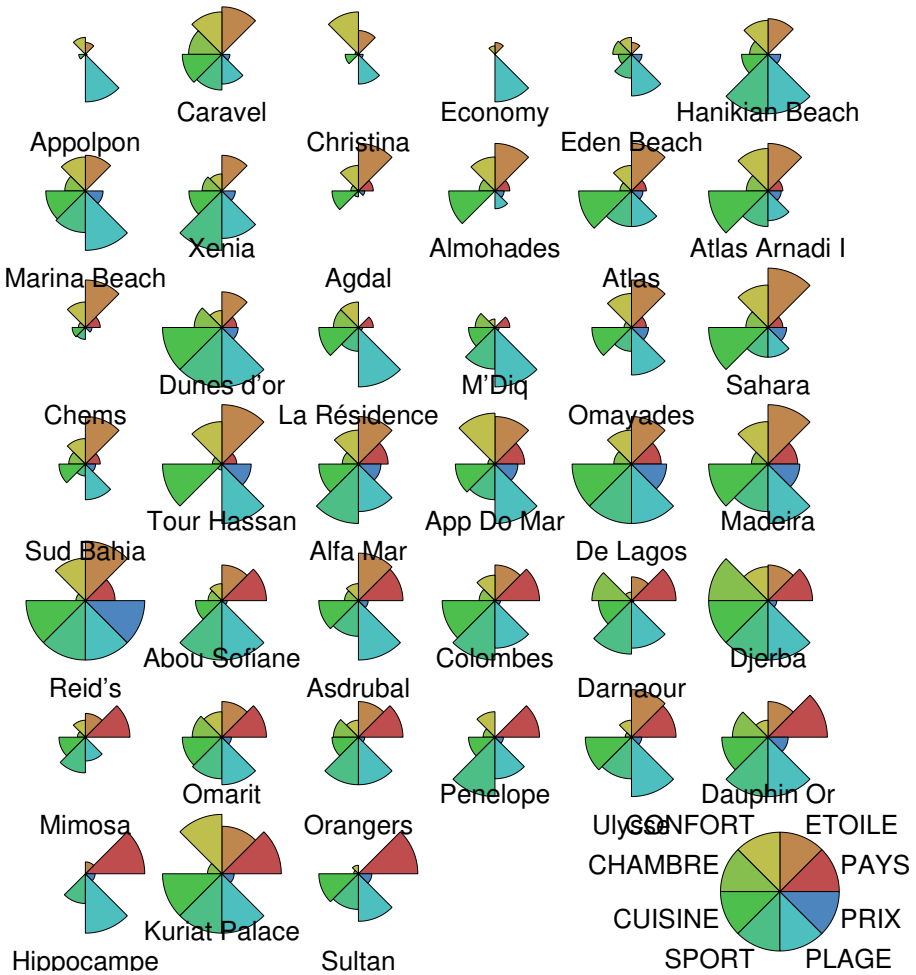
	CUISINE	SPORT	PLAGE	PRIX
1	Min. : 1.000	Min. : 0.000	Min. : 0.00	Min. : 369.0
2	1st Qu. : 5.000	1st Qu. : 4.000	1st Qu. : 6.50	1st Qu. : 447.0
3	Median : 7.000	Median : 6.000	Median : 8.00	Median : 495.0
4	Mean : 6.667	Mean : 6.231	Mean : 7.77	Mean : 529.9
5	3rd Qu. : 9.000	3rd Qu. :10.000	3rd Qu. :10.00	3rd Qu. : 574.0
6	Max. :10.000	Max. :10.000	Max. :10.00	Max. :1101.0

```
> palette(rainbow(12, s = 0.6, v = 0.75))
> stars(hotels, key.loc = c(14, 2), draw.segments = T,
+     main = "Diagramme en étoile des hôtels")
> palette("default")
```

	ETOILE	CONFORT	CHAMBRE	CUISINE	SPORT	PLAGE	PRIX
ETOILE	2.24	1.48	18.03	2.36	0.43	-0.51	111.63
CONFORT	1.48	2.47	17.01	2.32	0.19	-0.22	102.57
CHAMBRE	18.03	17.01	22449.75	167.10	246.90	74.76	-721.16
CUISINE	2.36	2.32	167.10	7.02	4.18	1.84	207.25
SPORT	0.43	0.19	246.90	4.18	11.87	4.98	147.87
PLAGE	-0.51	-0.22	74.76	1.84	4.98	7.39	126.37
PRIX	111.63	102.57	-721.16	207.25	147.87	126.37	19006.99

	ETOILE	CONFORT	CHAMBRE	CUISINE	SPORT	PLAGE	PRIX
ETOILE	1.00	0.63	0.08	0.60	0.08	-0.12	0.54
CONFORT	0.63	1.00	0.07	0.56	0.04	-0.05	0.47
CHAMBRE	0.08	0.07	1.00	0.42	0.48	0.18	-0.03
CUISINE	0.60	0.56	0.42	1.00	0.46	0.26	0.57
SPORT	0.08	0.04	0.48	0.46	1.00	0.53	0.31
PLAGE	-0.12	-0.05	0.18	0.26	0.53	1.00	0.34
PRIX	0.54	0.47	-0.03	0.57	0.31	0.34	1.00

Diagramme en étoile des hôtels

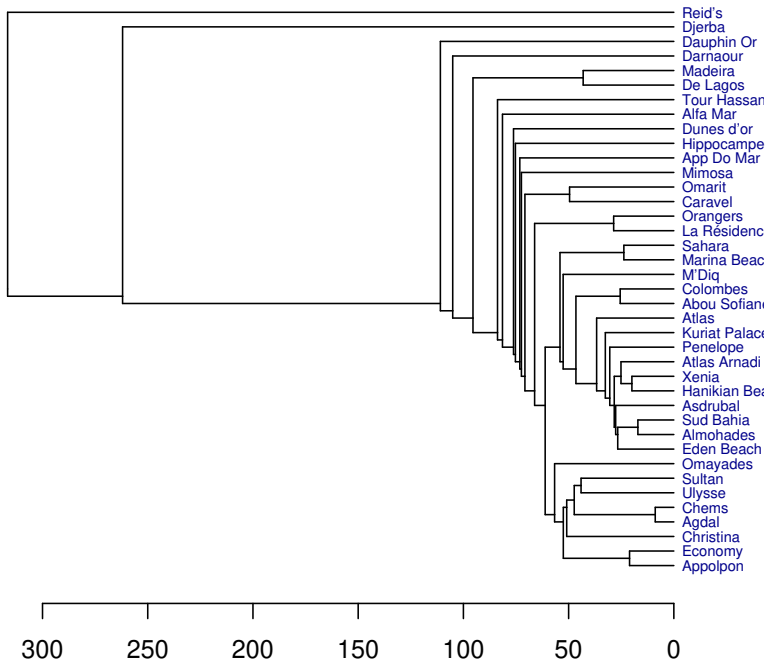


2. Faire la classification hiérarchique ascendante des observations en utilisant les distances euclidienne et Manhattan et les liaisons simple, complète et de Ward.

```
> library(cluster)
> hotelsnum <- hotels[, -1]
> res.cash <- agnes(hotelsnum, metric = "euclidean", method = "single")
> split(rownames(hotelsnum), cutree(res.cash, k = 4))
```

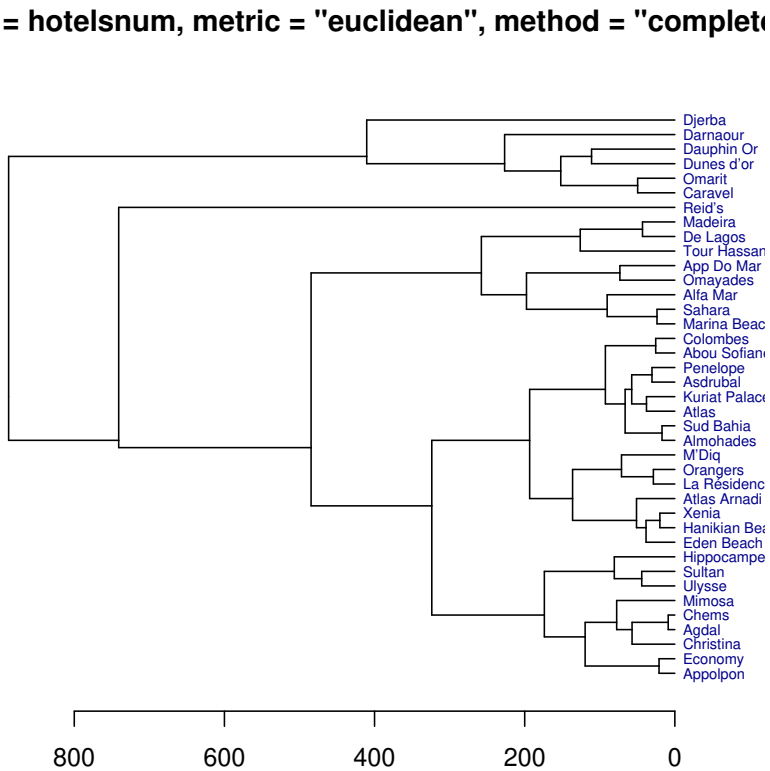
```
$`1`
 [1] "Appolpon"       "Caravel"        "Christina"
 [4] "Economy"        "Eden Beach"     "Hanikian Beach"
 [7] "Marina Beach"   "Xenia"          "Agdal"
[10] "Almohades"      "Atlas"          "Atlas Arnadi I"
[13] "Chems"          "Dunes d'or"     "La Résidence"
[16] "M'Diq"          "Omayades"       "Sahara"
[19] "Sud Bahia"      "Tour Hassan"    "Alfa Mar"
[22] "App Do Mar"     "De Lagos"       "Madeira"
[25] "Abou Sofiane"   "Asdrubal"       "Colombes"
[28] "Darnaour"       "Mimosa"         "Omarit"
[31] "Orangers"       "Penelope"       "Ulysse"
[34] "Hippocampe"     "Kuriat Palace"  "Sultan"

$`2`
[1] "Reid's"

$`3`
[1] "Djerba"

$`4`
[1] "Dauphin Or"
```

```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(hotelsnum, metric = "euclidean", method = "complete")
> split(rownames(hotelsnum), cutree(res.cash, k = 4))
$`1`
 [1] "Appolpon"       "Christina"      "Economy"
 [4] "Eden Beach"     "Hanikian Beach" "Xenia"
 [7] "Agdal"          "Almohades"      "Atlas"
[10] "Atlas Arnadi I" "Chems"          "La Résidence"
[13] "M'Diq"          "Sud Bahia"      "Abou Sofiane"
[16] "Asdrubal"       "Colombes"       "Mimosa"
[19] "Orangers"       "Penelope"       "Ulysse"
[22] "Hippocampe"     "Kuriat Palace"  "Sultan"

$`2`
[1] "Caravel"    "Dunes d'or" "Darnaour"   "Djerba"     "Omarit"
[6] "Dauphin Or"

$`3`
[1] "Marina Beach" "Omayades"     "Sahara"       "Tour Hassan"
[5] "Alfa Mar"     "App Do Mar"   "De Lagos"     "Madeira"

$`4`
[1] "Reid's"
```

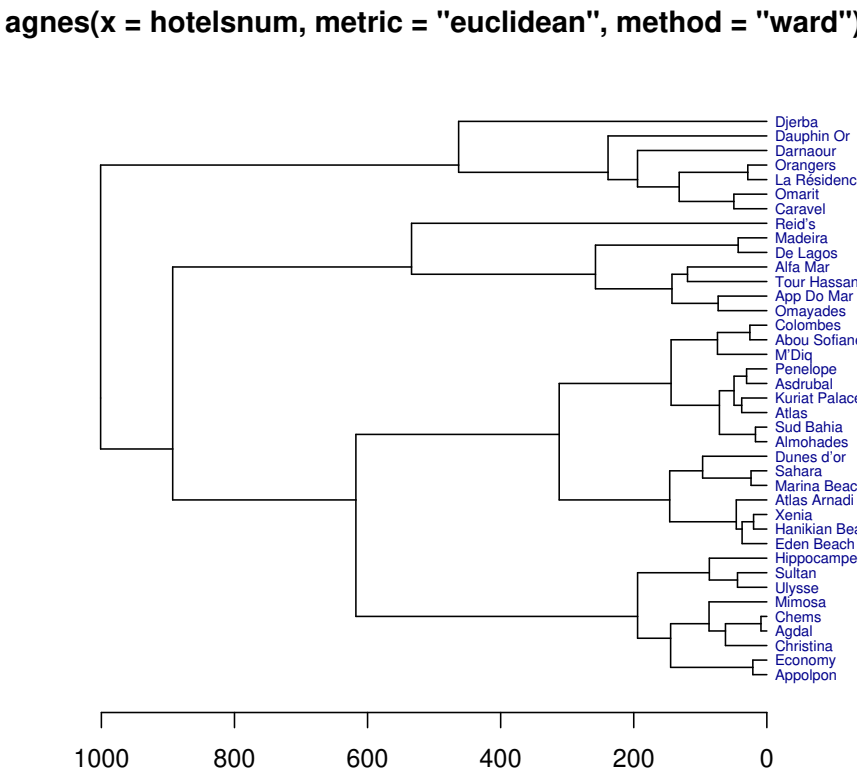
```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(hotelsnum, metric = "euclidean", method = "ward")
> split(rownames(hotelsnum), cutree(res.cash, k = 4))
$`1`
[1] "Appolpon"   "Christina"  "Economy"    "Agdal"      "Chems"
[6] "Mimosa"     "Ulysse"     "Hippocampe" "Sultan"

$`2`
[1] "Caravel"      "La Résidence" "Darnaour"     "Djerba"
[5] "Omarit"       "Orangers"     "Dauphin Or"

$`3`
 [1] "Eden Beach"     "Hanikian Beach" "Marina Beach"
 [4] "Xenia"          "Almohades"      "Atlas"
 [7] "Atlas Arnadi I" "Dunes d'or"     "M'Diq"
[10] "Sahara"         "Sud Bahia"      "Abou Sofiane"
[13] "Asdrubal"       "Colombes"       "Penelope"
[16] "Kuriat Palace"
```

```
$`4`
[1] "Omayades"    "Tour Hassan" "Alfa Mar"    "App Do Mar"
[5] "De Lagos"    "Madeira"     "Reid's"
```

```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```

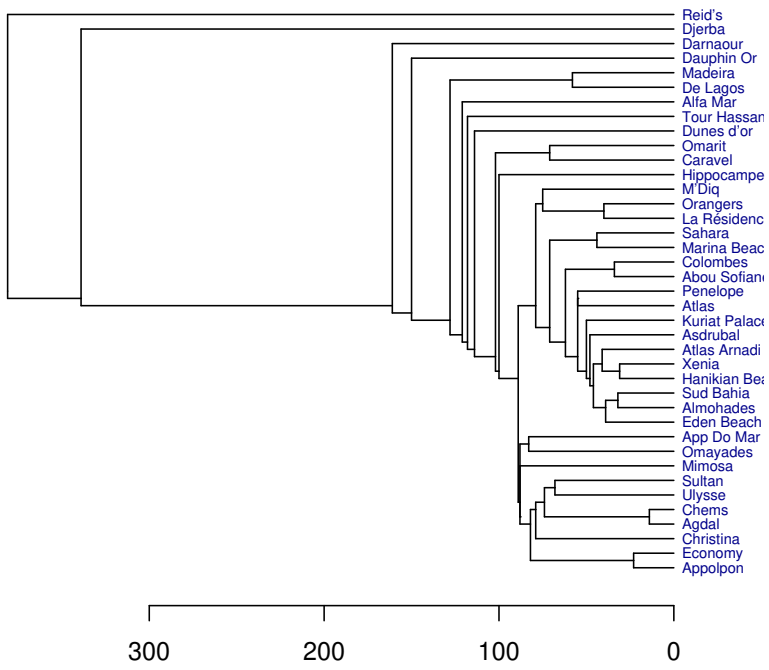



```
> res.cash <- agnes(hotelsnum, metric = "manhattan", method = "single")
> split(rownames(hotelsnum), cutree(res.cash, k = 4))
```

```
$`1`
 [1] "Appolpon"       "Caravel"        "Christina"
 [4] "Economy"        "Eden Beach"     "Hanikian Beach"
 [7] "Marina Beach"   "Xenia"          "Agdal"
[10] "Almohades"      "Atlas"          "Atlas Arnadi I"
[13] "Chems"          "Dunes d'or"     "La Résidence"
[16] "M'Diq"          "Omayades"       "Sahara"
[19] "Sud Bahia"      "Tour Hassan"    "Alfa Mar"
[22] "App Do Mar"     "De Lagos"       "Madeira"
[25] "Abou Sofiane"   "Asdrubal"       "Colombes"
[28] "Mimosa"         "Omarit"         "Orangers"
[31] "Penelope"       "Ulysse"         "Dauphin Or"
[34] "Hippocampe"     "Kuriat Palace"  "Sultan"
```

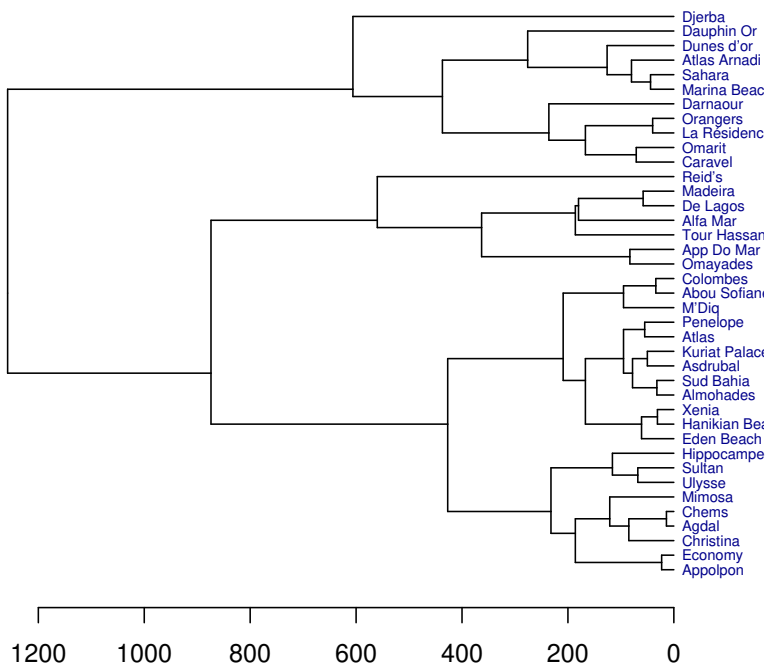
```
$`2`
[1] "Reid's"

$`3`
[1] "Darnaour"

$`4`
[1] "Djerba"
```

```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(hotelsnum, metric = "manhattan", method = "complete")
> split(rownames(hotelsnum), cutree(res.cash, k = 4))
$`1`
 [1] "Appolpon"       "Christina"      "Economy"
 [4] "Eden Beach"     "Hanikian Beach" "Xenia"
 [7] "Agdal"          "Almohades"      "Atlas"
[10] "Chems"          "M'Diq"          "Sud Bahia"
[13] "Abou Sofiane"   "Asdrubal"       "Colombes"
[16] "Mimosa"         "Penelope"       "Ulysse"
```

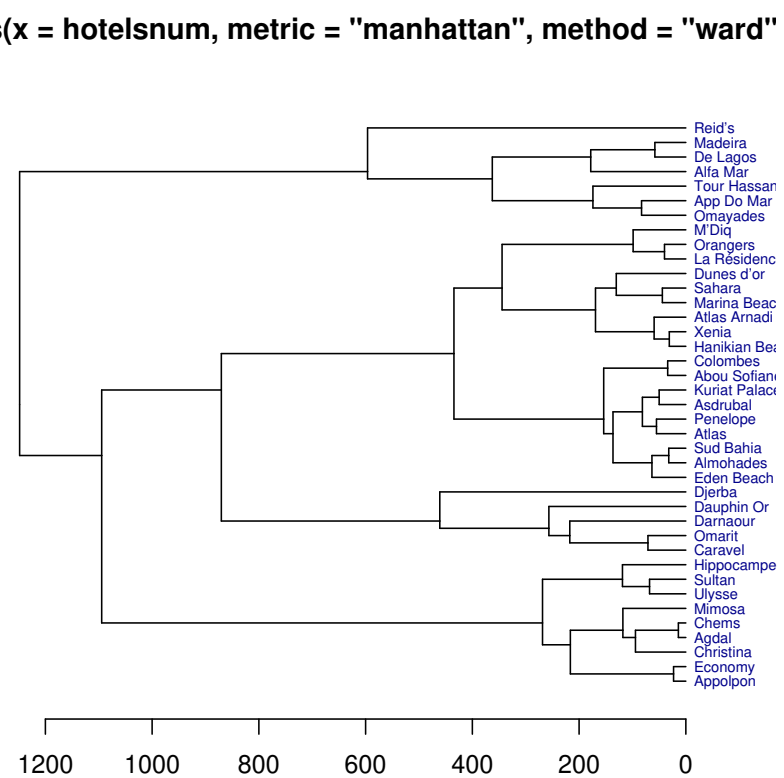
```
[19] "Hippocampe"     "Kuriat Palace"  "Sultan"

$`2`
 [1] "Caravel"        "Marina Beach"   "Atlas Arnadi I"
 [4] "Dunes d'or"     "La Résidence"   "Sahara"
 [7] "Darnaour"       "Omarit"         "Orangers"
[10] "Dauphin Or"

$`3`
[1] "Omayades"    "Tour Hassan" "Alfa Mar"    "App Do Mar"
[5] "De Lagos"    "Madeira"     "Reid's"

$`4`
[1] "Djerba"
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(hotelsnum, metric = "manhattan", method = "ward")
> split(rownames(hotelsnum), cutree(res.cash, k = 4))
$`1`
[1] "Appolpon"   "Christina"  "Economy"    "Agdal"      "Chems"
```

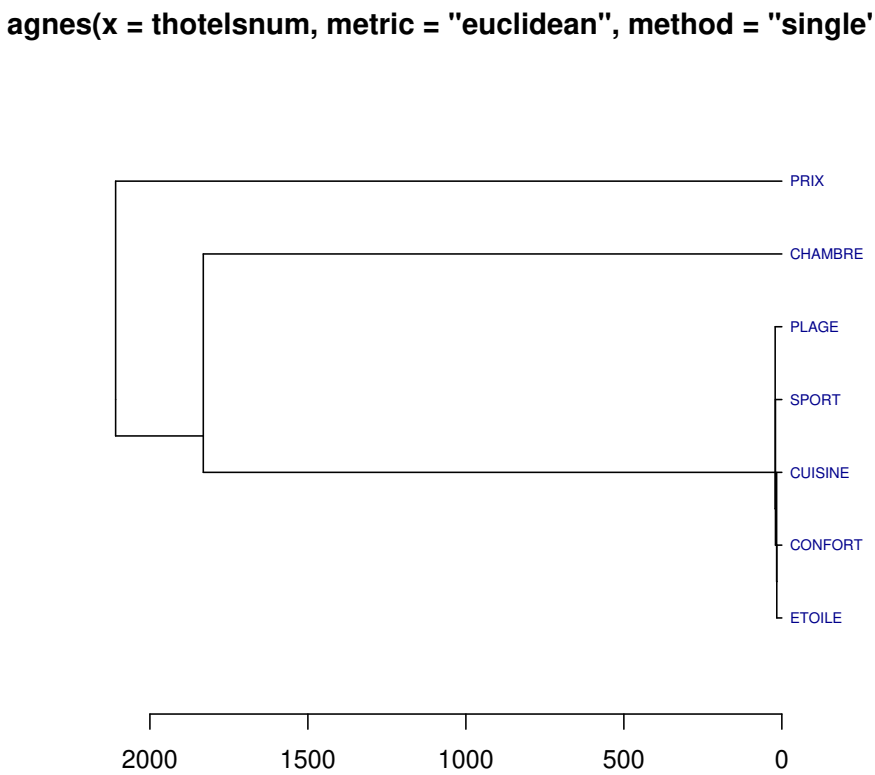
```
[6] "Mimosa"     "Ulysse"     "Hippocampe" "Sultan"

$`2`
[1] "Caravel"    "Darnaour"   "Djerba"     "Omarit"     "Dauphin Or"

$`3`
 [1] "Eden Beach"     "Hanikian Beach" "Marina Beach"
 [4] "Xenia"          "Almohades"      "Atlas"
 [7] "Atlas Arnadi I" "Dunes d'or"     "La Résidence"
[10] "M'Diq"          "Sahara"         "Sud Bahia"
[13] "Abou Sofiane"   "Asdrubal"       "Colombes"
[16] "Orangers"       "Penelope"       "Kuriat Palace"

$`4`
[1] "Omayades"    "Tour Hassan" "Alfa Mar"    "App Do Mar"
[5] "De Lagos"    "Madeira"     "Reid's"
```

```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```

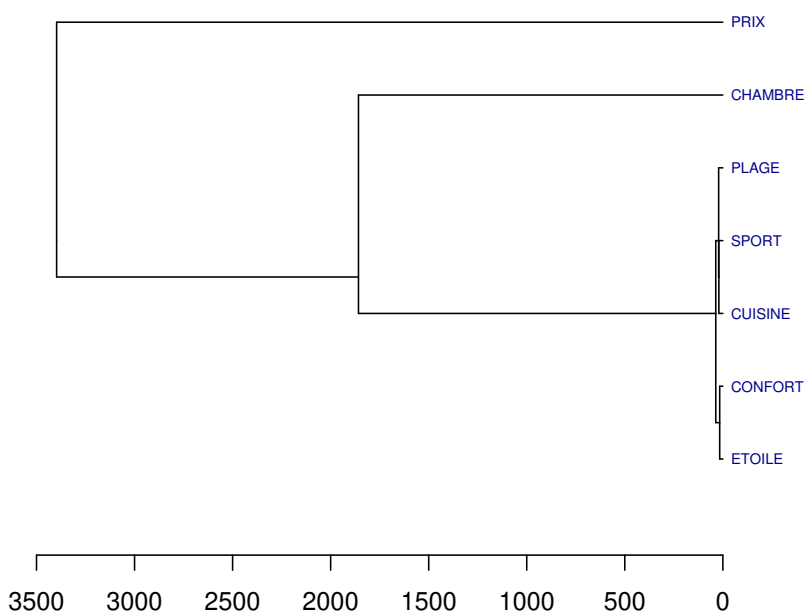


3. Faire la classification hiérarchique ascendante des variables en utilisant les distances euclidienne et Manhattan et les liaisons simple, complète et de Ward.

```
> thotelsnum <- t(hotelsnum)
> res.cash <- agnes(thotelsnum, metric = "euclidean",
+     method = "single")
> split(rownames(thotelsnum), cutree(res.cash, k = 4))
$`1`
[1] "ETOILE"  "CONFORT" "CUISINE" "SPORT"

$`2`
[1] "CHAMBRE"

$`3`
[1] "PLAGE"

$`4`
[1] "PRIX"
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```

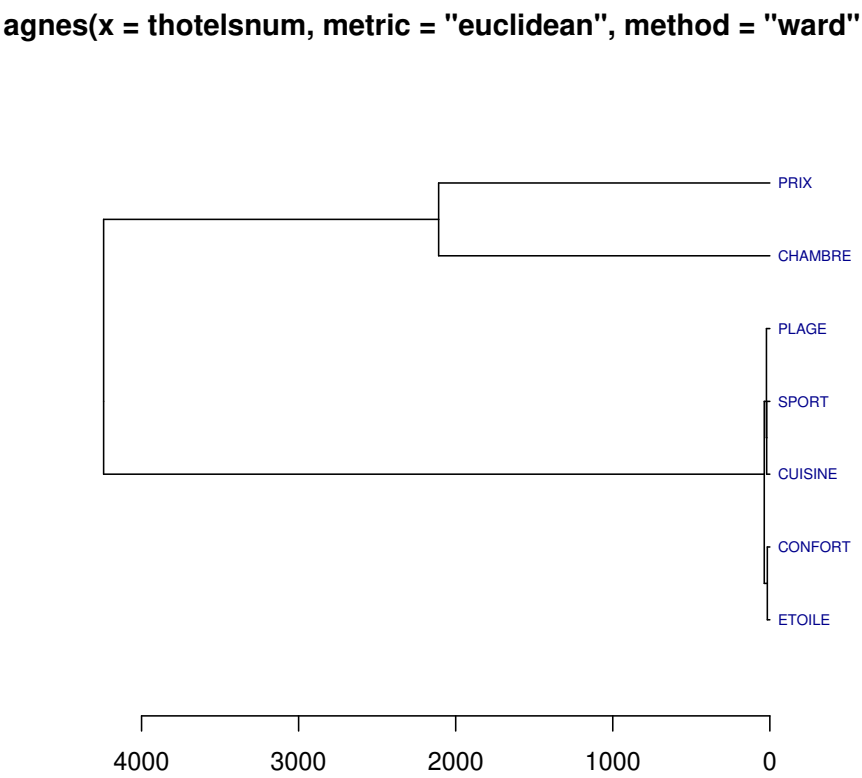


```
> res.cash <- agnes(thotelsnum, metric = "euclidean",
+     method = "complete")
> split(rownames(thotelsnum), cutree(res.cash, k = 4))

$`1`
[1] "ETOILE"  "CONFORT"

$`2`
[1] "CHAMBRE"

$`3`
[1] "CUISINE" "SPORT"   "PLAGE"

$`4`
[1] "PRIX"

> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```



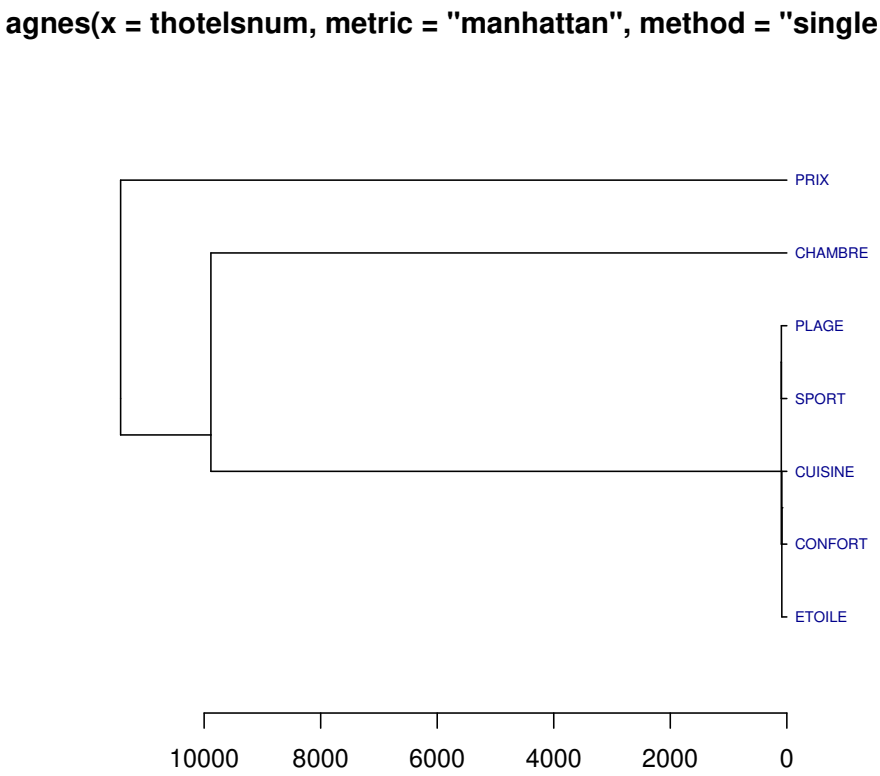

```
> res.cash <- agnes(thotelsnum, metric = "euclidean",
+     method = "ward")
> split(rownames(thotelsnum), cutree(res.cash, k = 4))
```

```
$`1`
[1] "ETOILE"  "CONFORT"

$`2`
[1] "CHAMBRE"

$`3`
[1] "CUISINE" "SPORT"   "PLAGE"

$`4`
[1] "PRIX"
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(thotelsnum, metric = "manhattan",
+     method = "single")
> split(rownames(thotelsnum), cutree(res.cash, k = 4))
$`1`
[1] "ETOILE"  "CONFORT" "CUISINE"

$`2`
```

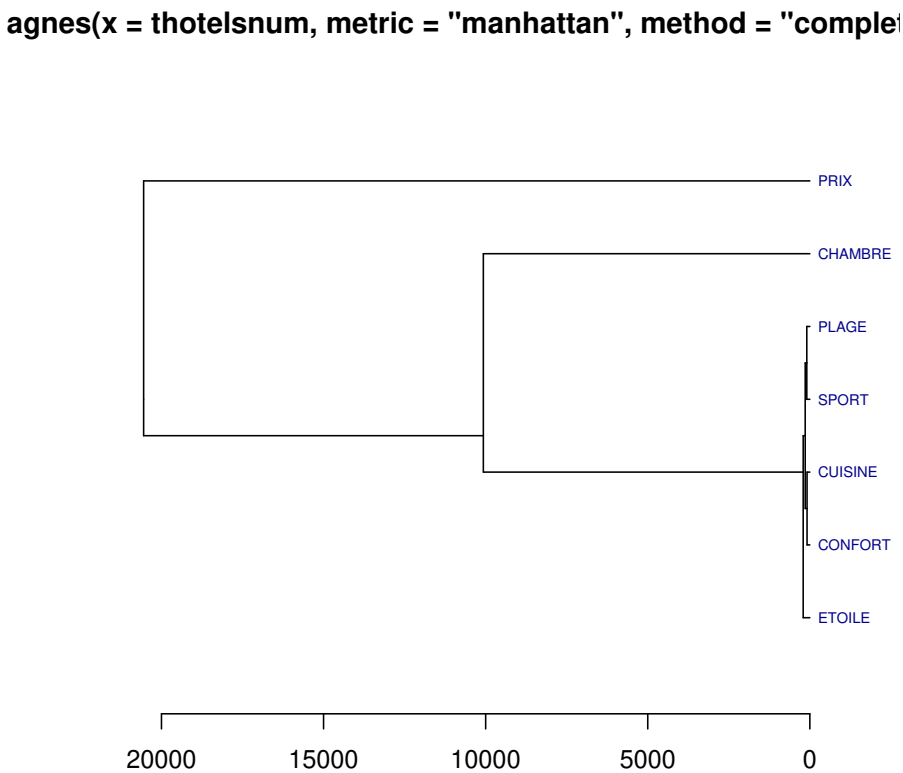
```
[1] "CHAMBRE"

$`3`
[1] "SPORT" "PLAGE"

$`4`
[1] "PRIX"
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(thotelsnum, metric = "manhattan",
+     method = "complete")
> split(rownames(thotelsnum), cutree(res.cash, k = 4))
$`1`
[1] "ETOILE"

$`2`
[1] "CONFORT" "CUISINE" "SPORT"   "PLAGE"

$`3`
[1] "CHAMBRE"
```

```
$`4`
[1] "PRIX"
```

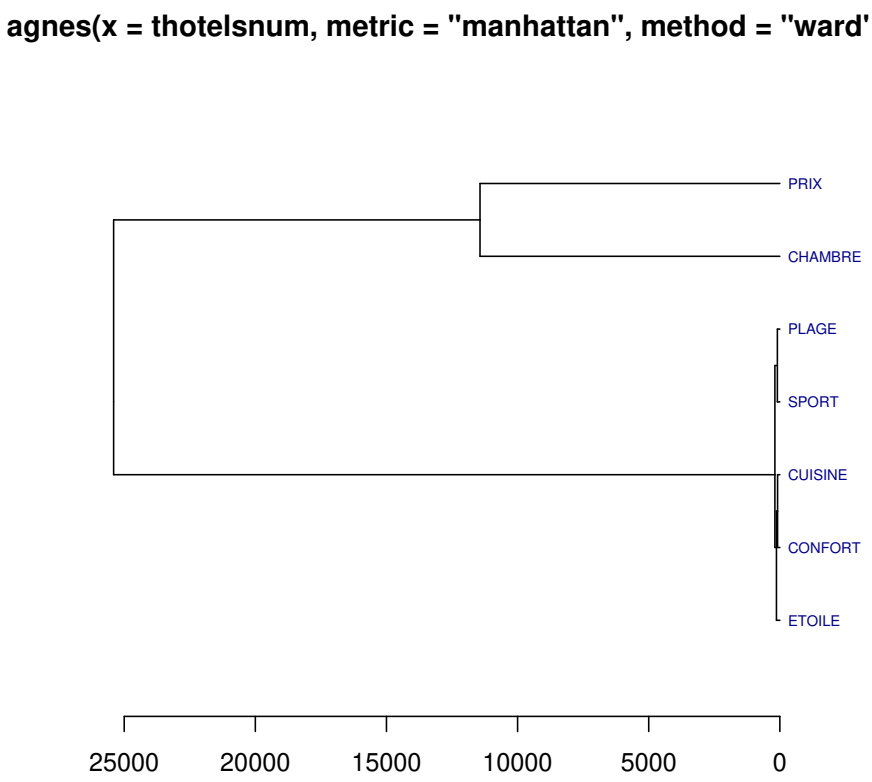
```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```




```
> res.cash <- agnes(thotelsnum, metric = "manhattan",
+     method = "ward")
> split(rownames(thotelsnum), cutree(res.cash, k = 4))
```

```
$`1`
[1] "ETOILE"  "CONFORT" "CUISINE"

$`2`
[1] "CHAMBRE"

$`3`
[1] "SPORT" "PLAGE"

$`4`
[1] "PRIX"
```

```
> res.dendro <- as.dendrogram(as.hclust(res.cash))
> plot(res.dendro, horiz = TRUE, center = TRUE, nodePar = list(lab.cex = 0.6,
+     lab.col = "darkblue", pch = NA), main = deparse(res.cash$call))
```

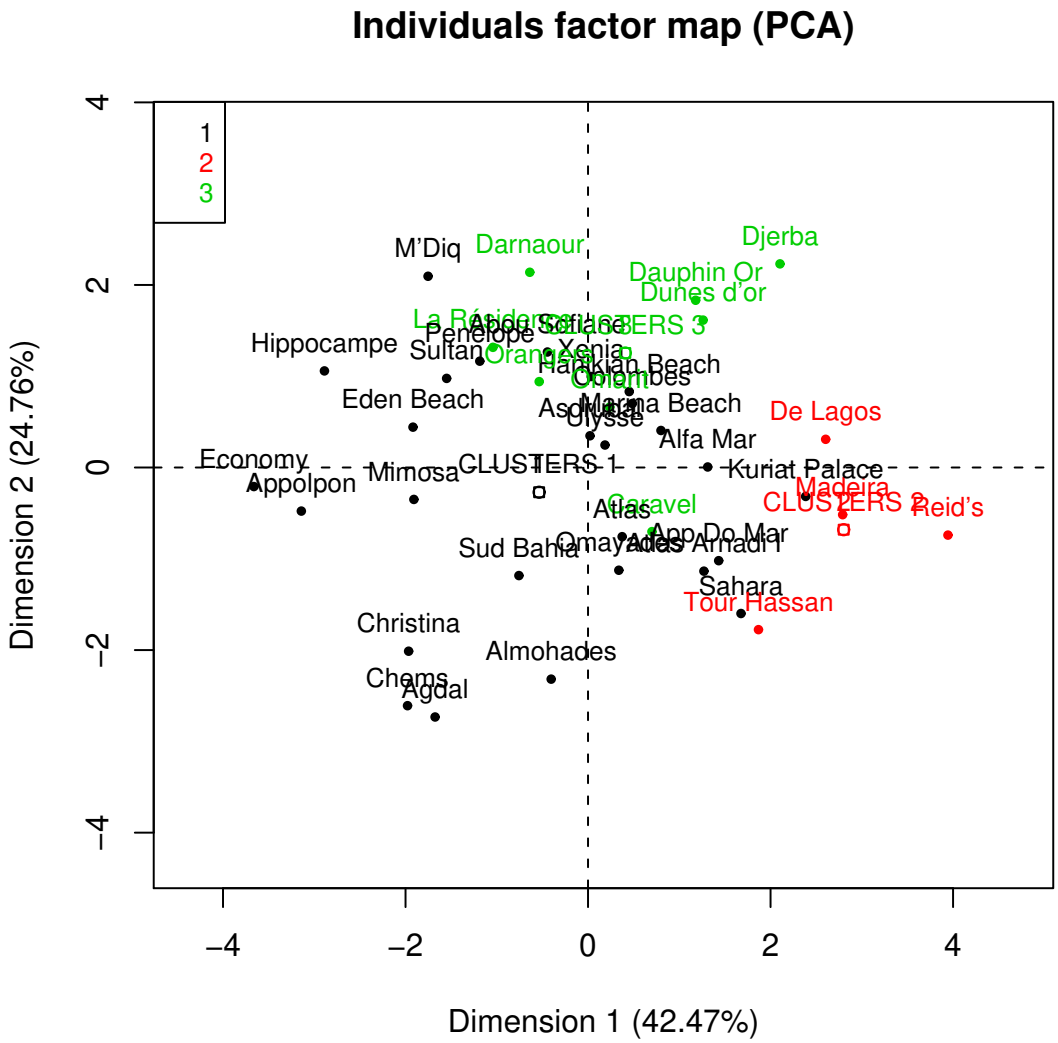


Partie II : K-moyennes

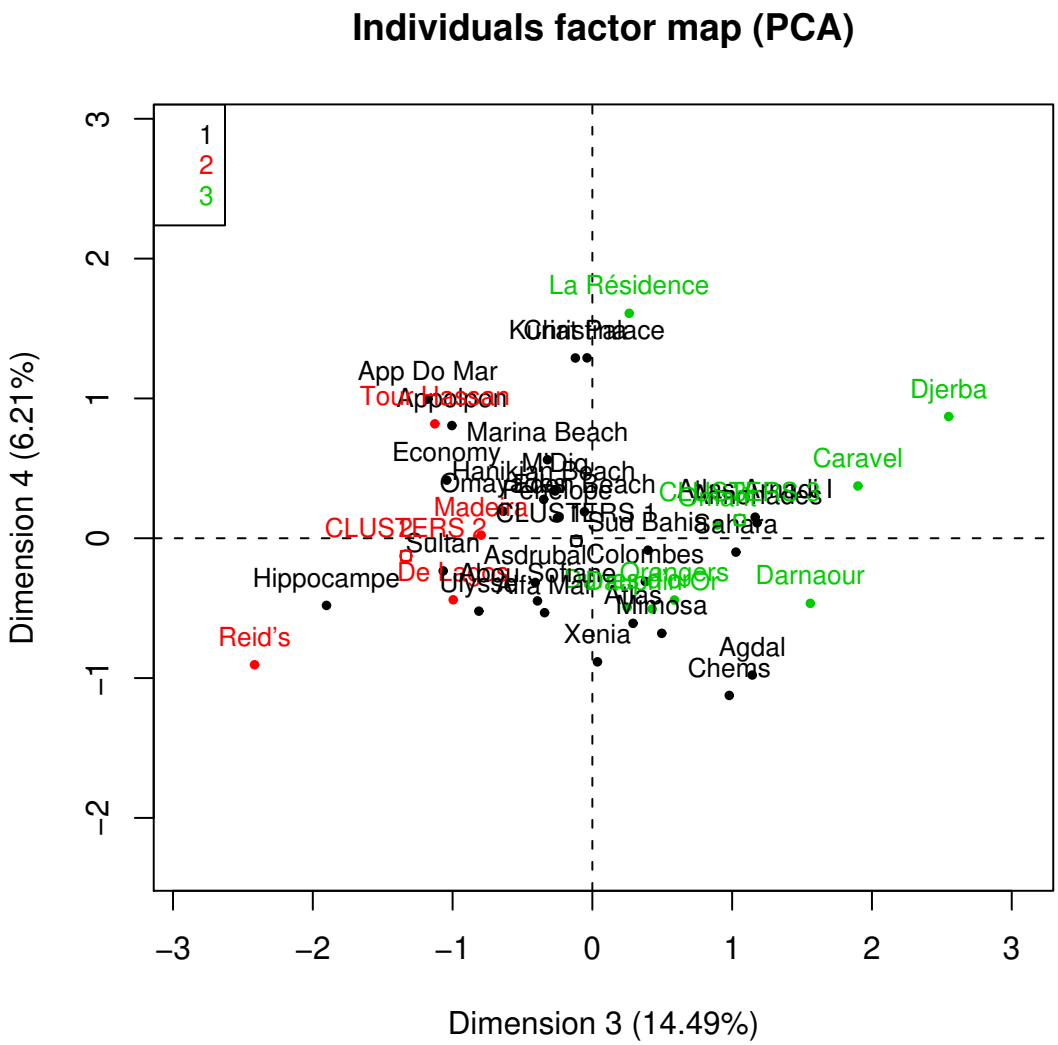
1. Obtenir la classification des hôtels en trois groupes à l'aide de la méthode des $K-$moyennes qui portera sur toutes les variables du tableau. Représenter graphiquement les trois groupes sur les premier et second plans factoriels qui ont été déterminés au TD 7. Qu'observe-t-on ? Comment se répartissent les groupes ?

```
> clhotel <- kmeans(hotelsnum, 3, nstart = 50)
> colhotnum <- cbind(factor(clhotel$cluster), hotelsnum)
> colcennum <- cbind(factor(1:3), clhotel$centers)
> colnames(colhotnum) <- c("CLUSTERS", colnames(hotelsnum))
> colnames(colcennum) <- c("CLUSTERS", colnames(hotelsnum))
> datas <- rbind(colcennum, colhotnum)
> datas$CLUSTERS <- factor(datas$CLUSTERS)
> plot(hotelsnum, col = colhotnum$CLUSTERS)
> library(FactoMineR)
```

```
> res.pca <- PCA(datas, graph = FALSE, quali.sup = 1,
+     ind.sup = 1:3)
> plot(res.pca, habillage = 1, new.plot = FALSE, cex = 0.8)
```



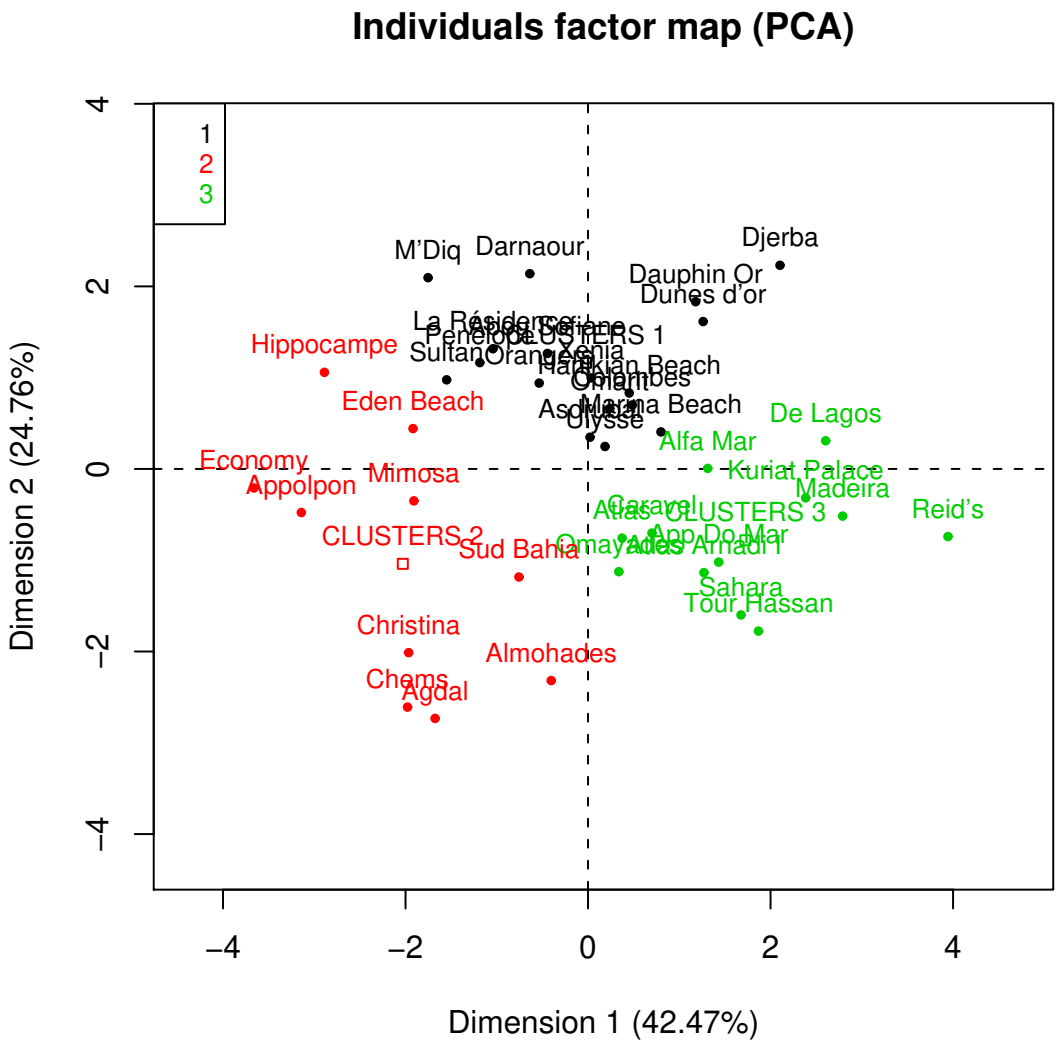

```
> plot(res.pca, axes = c(3, 4), habillage = 1, new.plot = FALSE,
+     cex = 0.8)
```



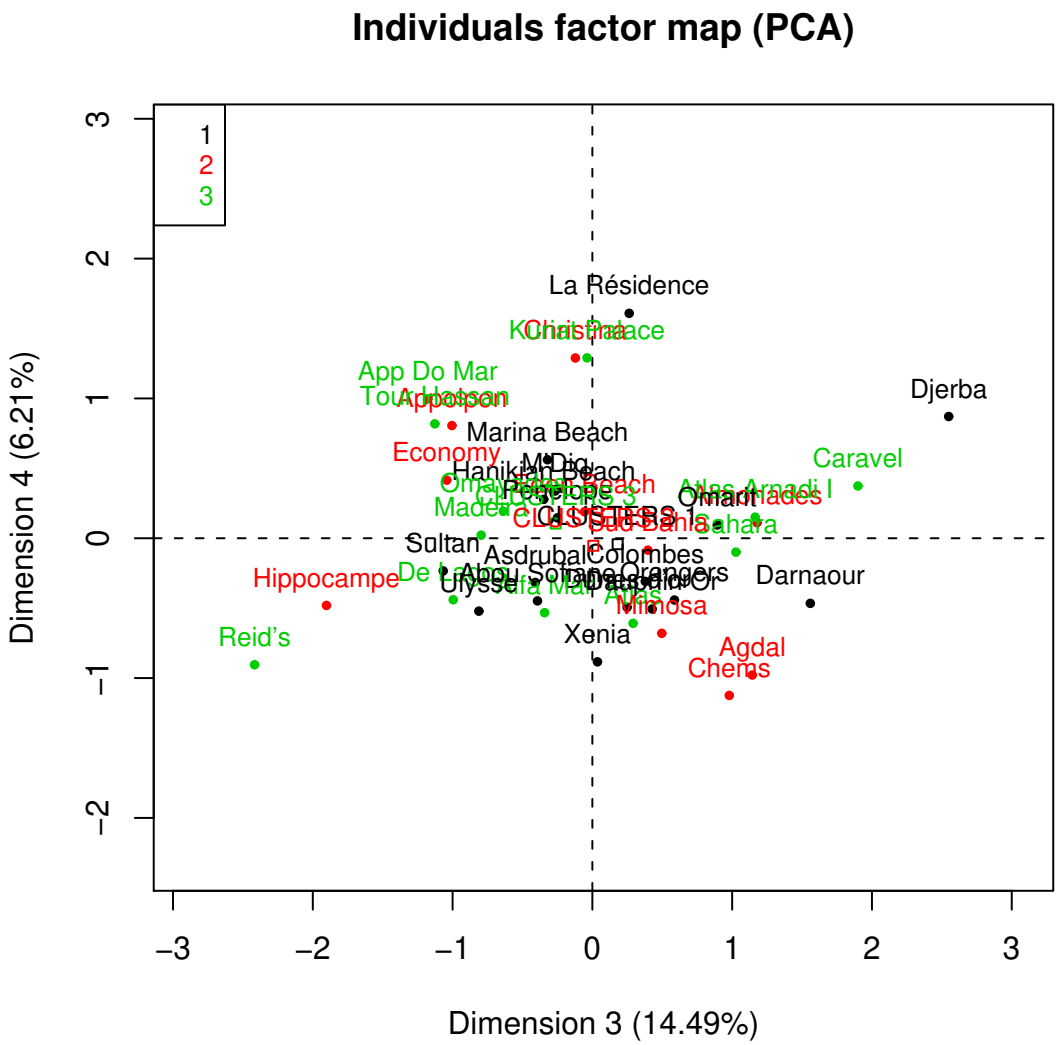
2. Obtenir la classification des hôtels en trois groupes à l'aide de la méthode des $K-$moyennes qui portera sur les coordonnées des hôtels dans le premier plan factoriel. Représenter graphiquement ces trois nouveaux groupes sur le premier plan factoriel. Qu'observe-t-on ? Comment se répartissent les groupes ?

```
> clhotel2 <- kmeans(res.pca$ind$coord[, 1:4], 3, nstart = 50)
> colhotnum2 <- data.frame(cbind(factor(clhotel2$cluster),
+     hotelsnum))
> colnames(colhotnum2) <- c("CLUSTERS", colnames(hotelsnum))
> datas2 <- colhotnum2
> datas2$CLUSTERS <- factor(datas2$CLUSTERS)
> plot(hotelsnum, col = colhotnum2$CLUSTERS)
```

```
> res.pca2 <- PCA(datas2, graph = FALSE, quali.sup = 1)
> plot(res.pca2, habillage = 1, new.plot = FALSE, cex = 0.8)
```



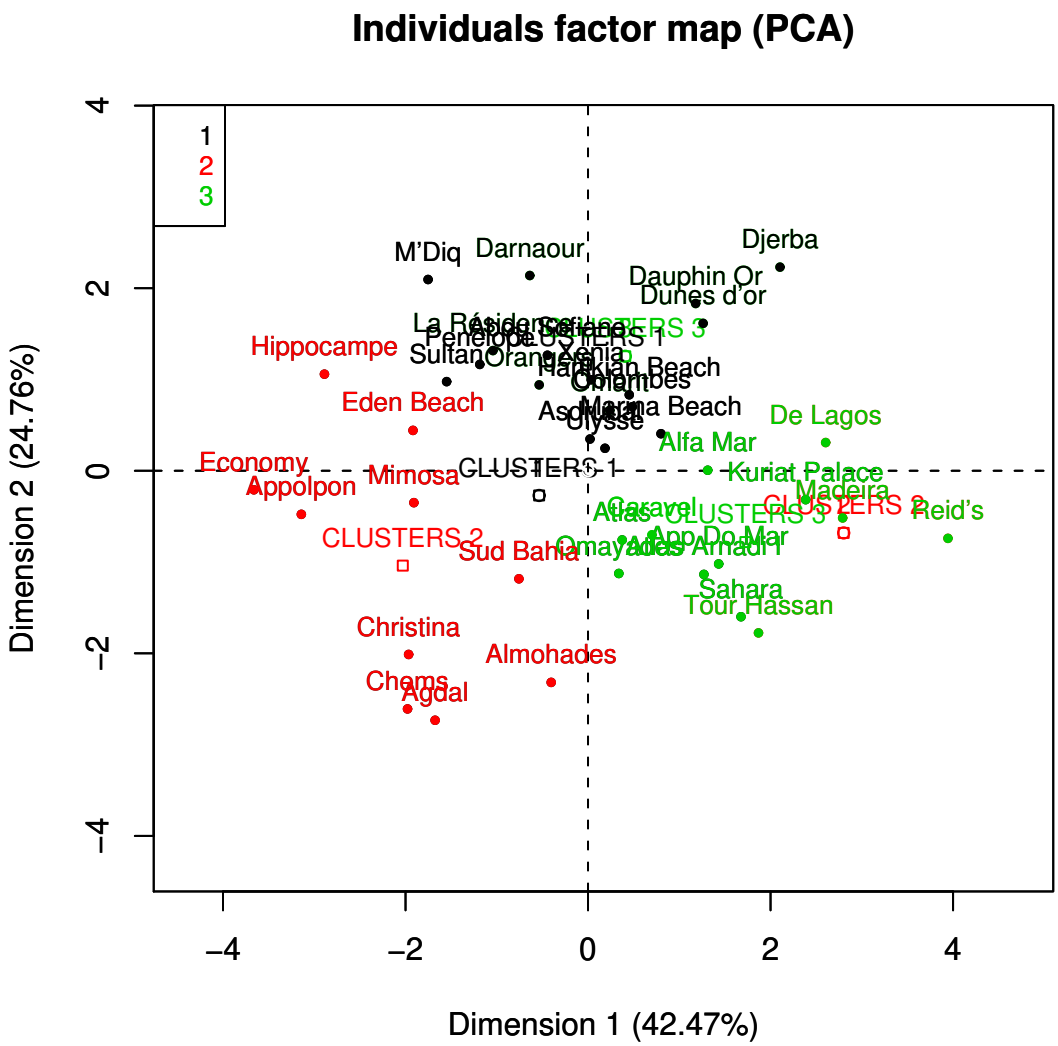

```
> plot(res.pca2, axes = c(3, 4), habillage = 1, new.plot = FALSE,
+     cex = 0.8)
```

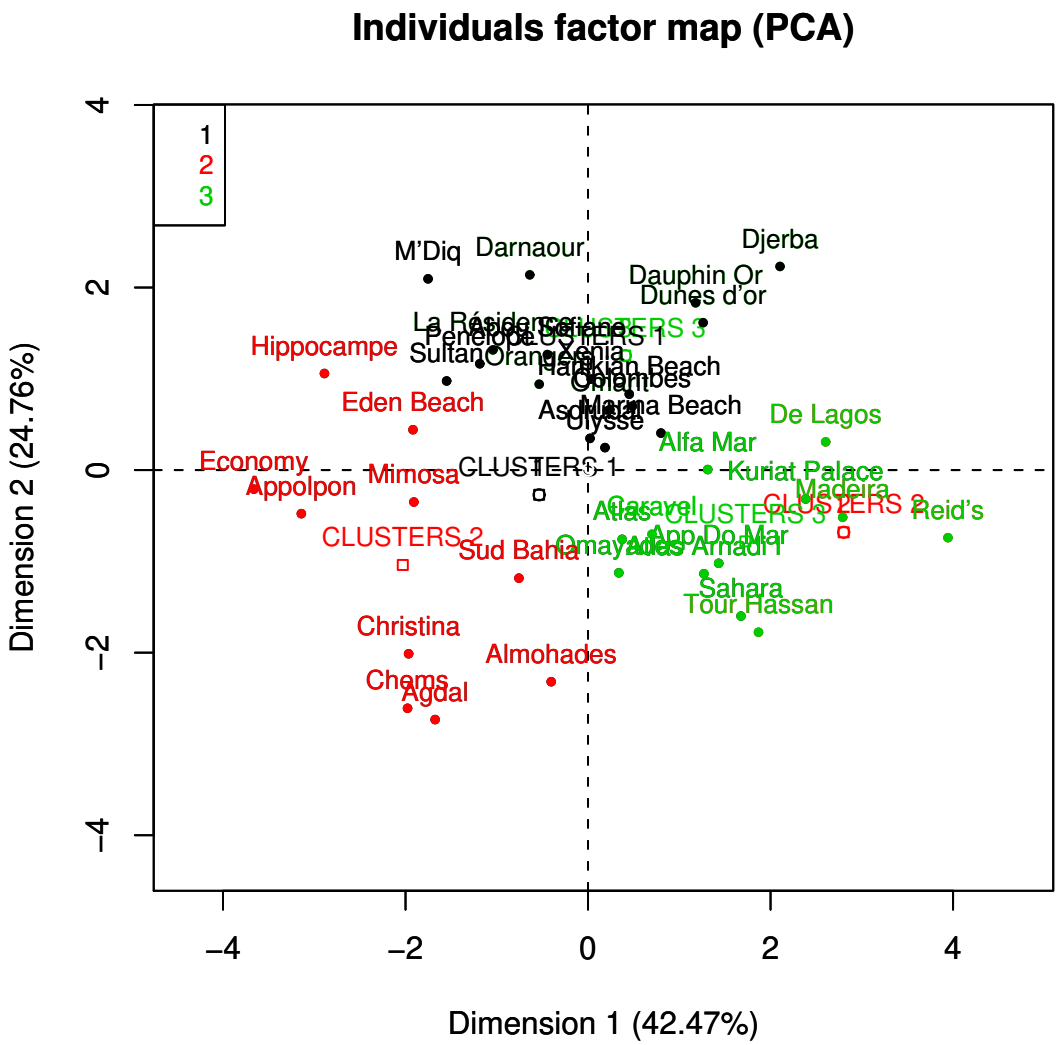


3. Quelles sont les différences de classement entre les deux classements de la question 1. et de la question 2. ? Le premier plan factoriel traduit-il fidèlement l'ensemble des données ? On pourra se réferrer au diagramme des valeurs propres obtenu au TD 5.

```
> layout(1:2)
> plot(PCA(datas, graph = FALSE, quali.sup = 1, ind.sup = 1:3),
+     habillage = 1, new.plot = FALSE, cex = 0.8)
> plot(PCA(datas2, graph = FALSE, quali.sup = 1), habillage = 1,
+     new.plot = FALSE, cex = 0.8)
> layout(1)
> layout(1:2)
> plot(PCA(datas, graph = FALSE, quali.sup = 1, ind.sup = 1:3),
+     habillage = 1, new.plot = FALSE, cex = 0.8)
```

```
> plot(PCA(datas2, graph = FALSE, quali.sup = 1), habillage = 1,
+     new.plot = FALSE, cex = 0.8)
> layout(1)
```



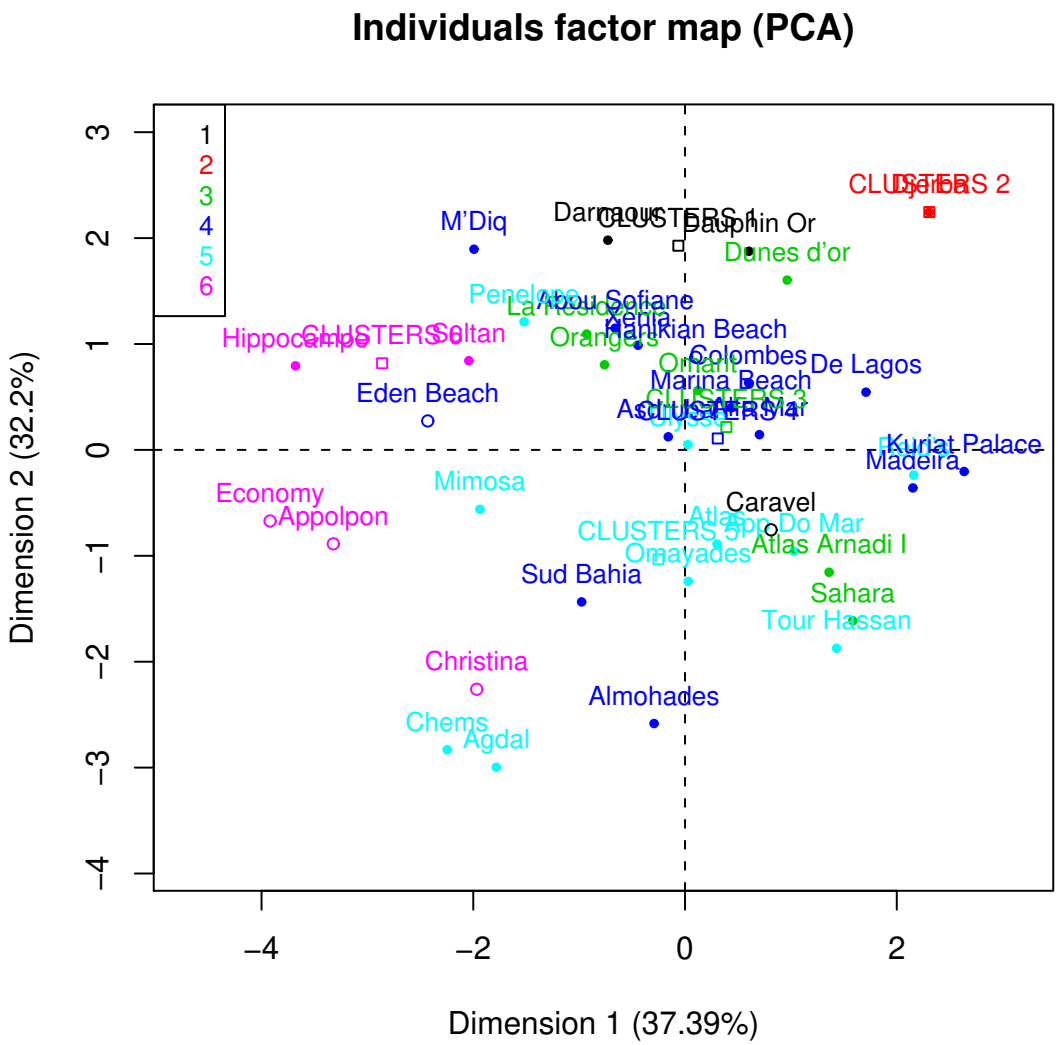


4. On décide de vérifier si l'attribution des étoiles est conforme aux critères de constitution des groupes par la méthode des $K-$moyennes. Puisqu'il existe 6 catégories d'étoiles, de 0 à 5, classer les hôtels en 6 groupes à l'aide de la méthode des $K-$moyennes portant cette fois-ci sur toutes les variables à l'exclusion de la variable prix. Attention les groupes obtenus ne sont pas nécessairement numérotés par ordre croissant des étoiles.

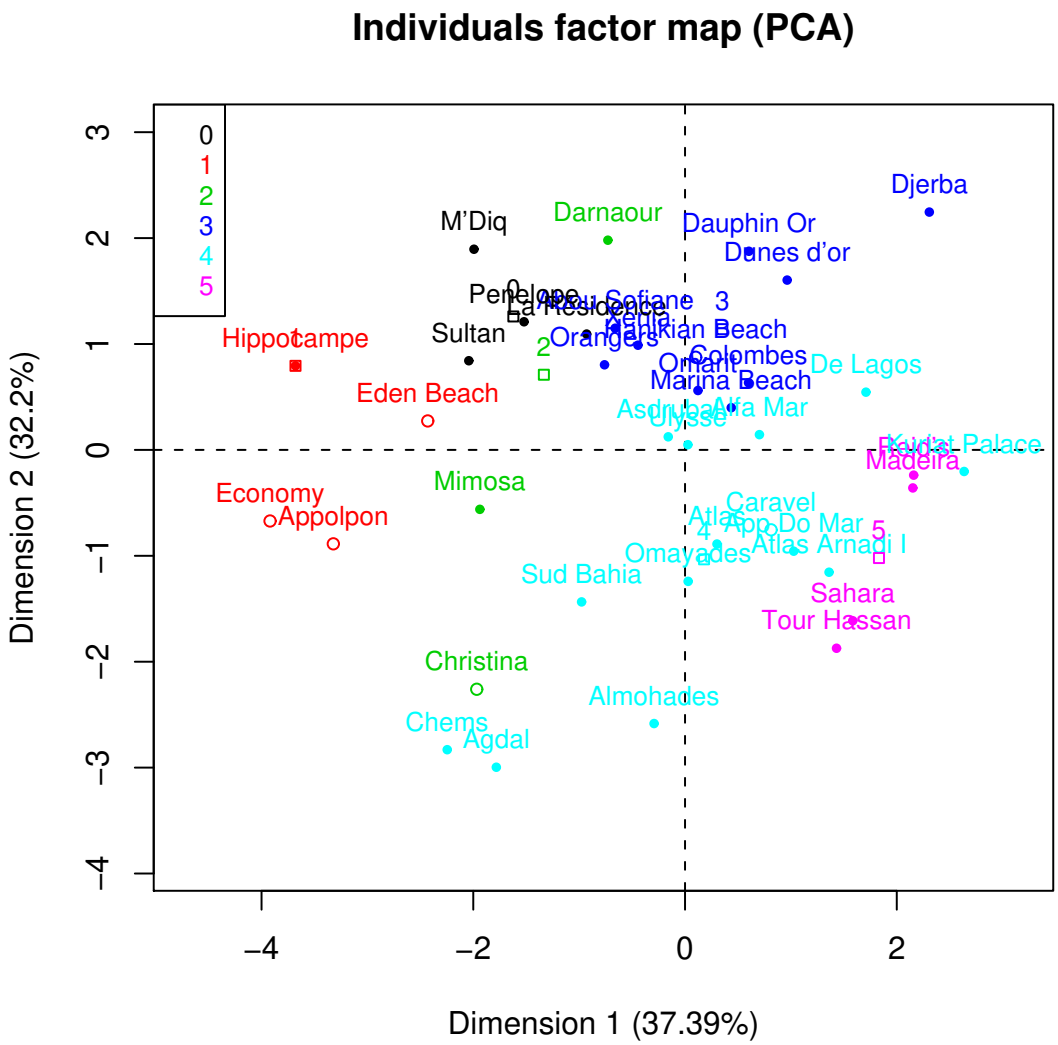
```
> hotelsnum2 <- hotelsnum[, -7]
> clhotel3 <- kmeans(hotelsnum2, 6, nstart = 50)
> colhotnum3 <- cbind(factor(clhotel3$cluster), factor(hotels$ETOILE),
+     hotelsnum2)
> colnames(colhotnum3) <- c("CLUSTERS", "ETOILE_Q", colnames(hotelsnum2))
> datas3 <- colhotnum3
> datas3$CLUSTERS <- factor(datas3$CLUSTERS)
> plot(hotelsnum2, col = colhotnum3$CLUSTERS)
> cbind(clhotel3$cluster, hotels$ETOILE)
```

```
               [,1] [,2]
Appolpon          6    1
Caravel           1    4
Christina         6    2
Economy           6    1
Eden Beach        4    1
Hanikian Beach    4    3
Marina Beach      4    3
Xenia             4    3
Agdal             5    4
Almohades         4    4
Atlas             5    4
Atlas Arnadi I    3    4
Chems             5    4
Dunes d'or        3    3
La Résidence      3    0
M'Diq             4    0
Omayades          5    4
Sahara            3    5
Sud Bahia         4    4
Tour Hassan       5    5
Alfa Mar          4    4
App Do Mar        5    4
De Lagos          4    4
Madeira           4    5
Reid's            5    5
Abou Sofiane      4    3
Asdrubal          4    4
Colombes          4    3
Darnaour          1    2
Djerba            2    3
Mimosa            5    2
Omarit            3    3
Orangers          3    3
Penelope          5    0
Ulysse            5    4
Dauphin Or        1    3
Hippocampe        6    1
Kuriat Palace     4    4
Sultan            6    0
```

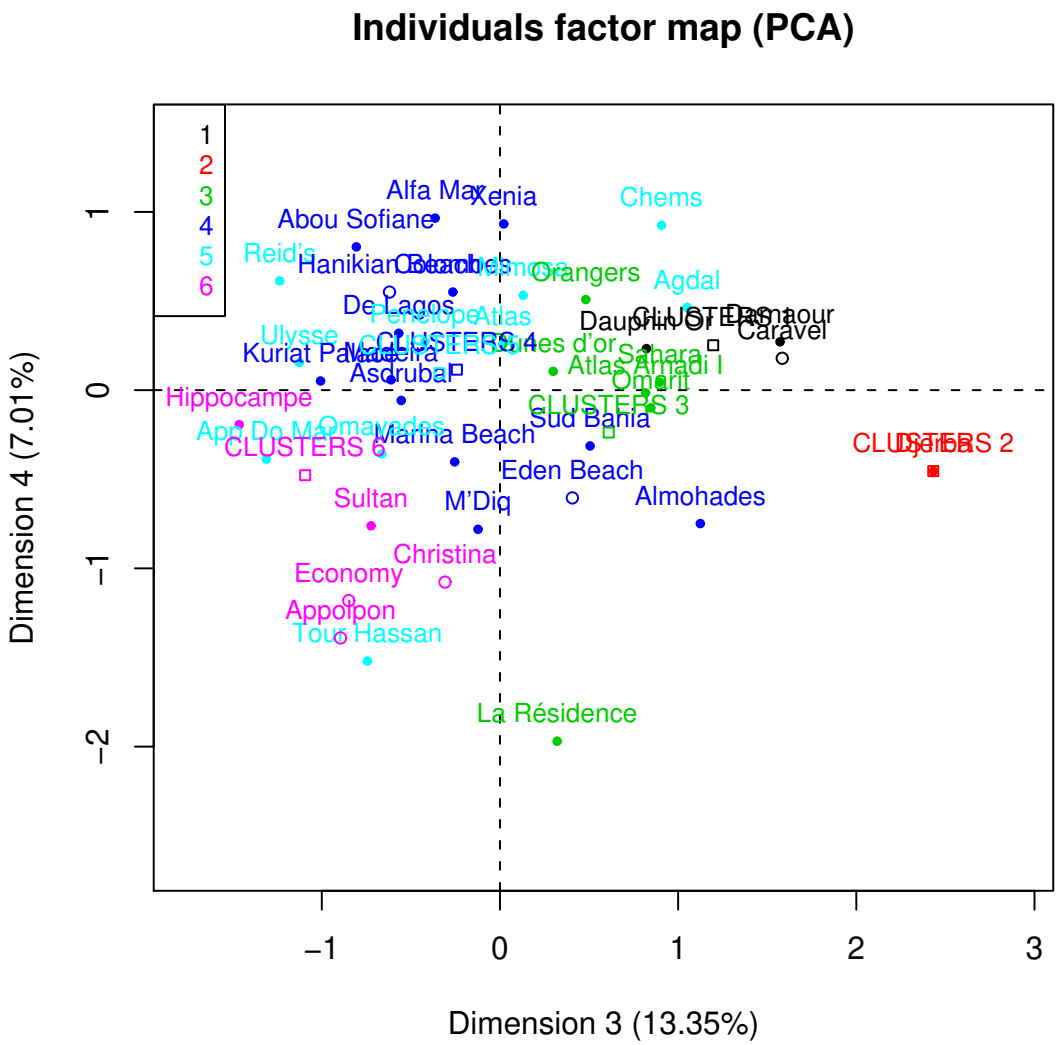
```
> res.pca3 <- PCA(datas3, graph = FALSE, quali.sup = c(1,
+     2), ind.sup = 1:6)
> plot(res.pca3, habillage = 1, new.plot = FALSE, cex = 0.8)
```



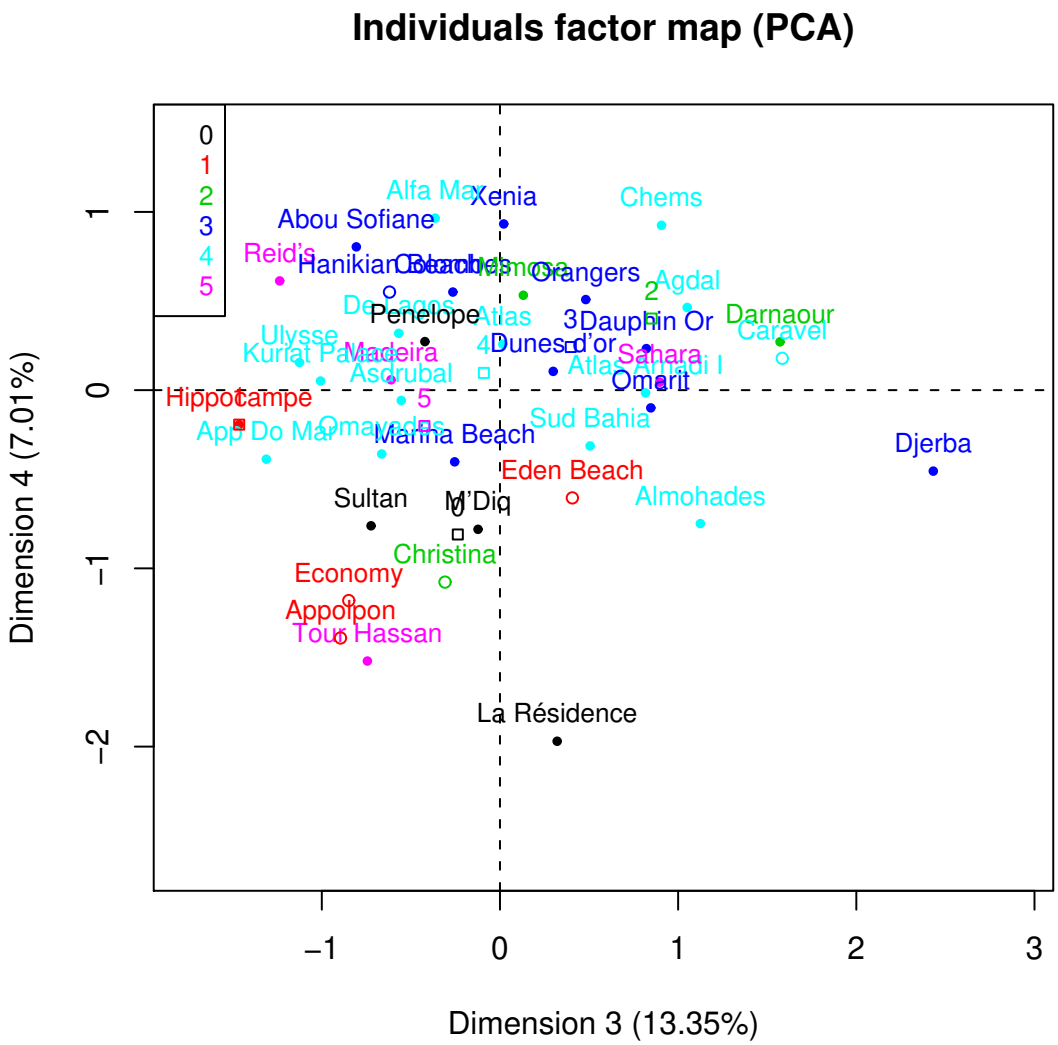

```
> plot(res.pca3, habillage = 2, new.plot = FALSE, cex = 0.8)
```




```
> plot(res.pca3, axes = c(3, 4), habillage = 1, new.plot = FALSE,
+     cex = 0.8)
```




```
> plot(res.pca3, axes = c(3, 4), habillage = 2, new.plot = FALSE,
+     cex = 0.8)
```


Individuals factor map (PCA)
0
1
2
3
4
5
Alfa Max
Xenia
Chems
Abou Sofiane
Reid's
Hanikian
Orangers
Agdal
Penelope
Atlas
Dauphin Or
Darnaour
Ulysse
Kurlat Palace
Madeira
Dunes d'or
Sahara
Caravel
Asdrubal
Atlas Anfadi I
Omarit
Hippocampe
App Do Mar
Marina Beach
Sud Bahia
Djerba
Eden Beach
Sultan
M'Dig
Almohades
Christina
Economy
Appolpon
Tour Hassan
La Résidence
Dimension 4 (7.01%)
Dimension 3 (13.35%)
−1
0
1
2
3
−2

NUMERO	NOM	PAYS	ETOILE	CONFORT	CHAMBRE	CUISINE	SPORT	PLAGE	PRIX
1	Appolpon	Grèce	1	4	56	2	0	8	390
2	Caravel	Grèce	4	7	471	7	6	5	468
3	Christina	Grèce	2	7	93	3	0	5	427
4	Economy	Grèce	1	3	56	1	0	8	369
5	Eden Beach	Grèce	1	4	286	3	4	7	499
6	Hanikian Beach	Grèce	3	6	282	5	10	10	526
7	Marina Beach	Grèce	3	6	310	7	7	10	587
8	Xenia	Grèce	3	4	300	6	10	8	534
9	Agdal	Maroc	4	5	146	5	1	0	447
10	Almohades	Maroc	4	6	250	8	0	3	482
11	Atlas	Maroc	4	5	196	9	6	6	511
12	Atlas Arnadi I	Maroc	4	7	324	10	6	5	532
13	Chems	Maroc	4	5	138	3	2	0	450
14	Dunes d'or	Maroc	3	4	400	10	10	10	569
15	La Résidence	Maroc	0	5	366	7	4	10	419
16	M'Diq	Maroc	0	3	300	5	7	10	421
17	Omayades	Maroc	4	6	144	7	4	8	579
18	Sahara	Maroc	5	7	330	10	5	5	598
19	Sud Bahia	Maroc	4	5	260	5	2	6	495
20	Tour Hassan	Maroc	5	7	170	10	1	10	730
21	Alfa Mar	Portugal	4	6	254	7	10	8	646
22	App,Do Mar	Portugal	4	8	140	7	6	10	652
23	De Lagos	Portugal	4	6	273	10	10	10	802
24	Madeira	Portugal	5	7	260	10	8	10	761
25	Reid's	Portugal	5	7	169	10	10	10	1101
26	Abou Sofiane	Tunisie	3	4	225	5	10	10	434
27	Asdrubal	Tunisie	4	4	225	7	6	10	489
28	Colombes	Tunisie	3	5	250	9	10	8	436

NUMERO	NOM	PAYS	ETOILE	CONFORT	CHAMBRE	CUISINE	SPORT	PLAGE	PRIX
29	Darnaour	Tunisie	2	3	550	6	9	8	399
30	Djerba	Tunisie	3	6	800	10	10	10	477
31	Mimosa	Tunisie	2	4	150	5	6	4	375
32	Omarit	Tunisie	3	5	425	7	7	8	486
33	Orangers	Tunisie	3	4	366	5	8	8	447
34	Penelope	Tunisie	0	5	200	5	10	7	473
35	Ulysse	Tunisie	4	4	130	8	7	10	495
36	Dauphin Or	Turquie	3	4	500	8	10	10	617
37	Hippocampe	Turquie	1	2	50	1	5	10	489
38	Kuriat Palace	Turquie	4	9	232	10	10	10	520
39	Sultan	Turquie	0	3	110	7	6	8	534

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