587_project_code

Soham Deshmukh

18/04/2022

```
knitr::opts_chunk$set(echo = TRUE)

library(dbscan)
```

```
## Warning: package 'dbscan' was built under R version 4.1.3
```

```
library(caret)
```

```
## Loading required package: lattice
```

```
## Loading required package: ggplot2
```

```
library(fpc)
```

```
## Warning: package 'fpc' was built under R version 4.1.3
```

```
##
## Attaching package: 'fpc'
```

```
## The following object is masked from 'package:dbscan':
##
##     dbscan
```

```
library("factoextra")
```

```
## Warning: package 'factoextra' was built under R version 4.1.3
```

```
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
```

```
set.seed(123456789)

db_iris = dbscan(iris[c(-5)], eps = 0.1, MinPts = 4)
db_iris
```

```
## dbscan Pts=150 MinPts=4 eps=0.1
##
##   0
## 150
```

```
db_iris = dbscan(iris[c(-5)], eps = 0.2, MinPts = 4)
db_iris
```

```
## dbscan Pts=150 MinPts=4 eps=0.2
##          0  1 2 3
## border 128  2 3 3
## seed     0  8 5 1
## total  128 10 8 4
```

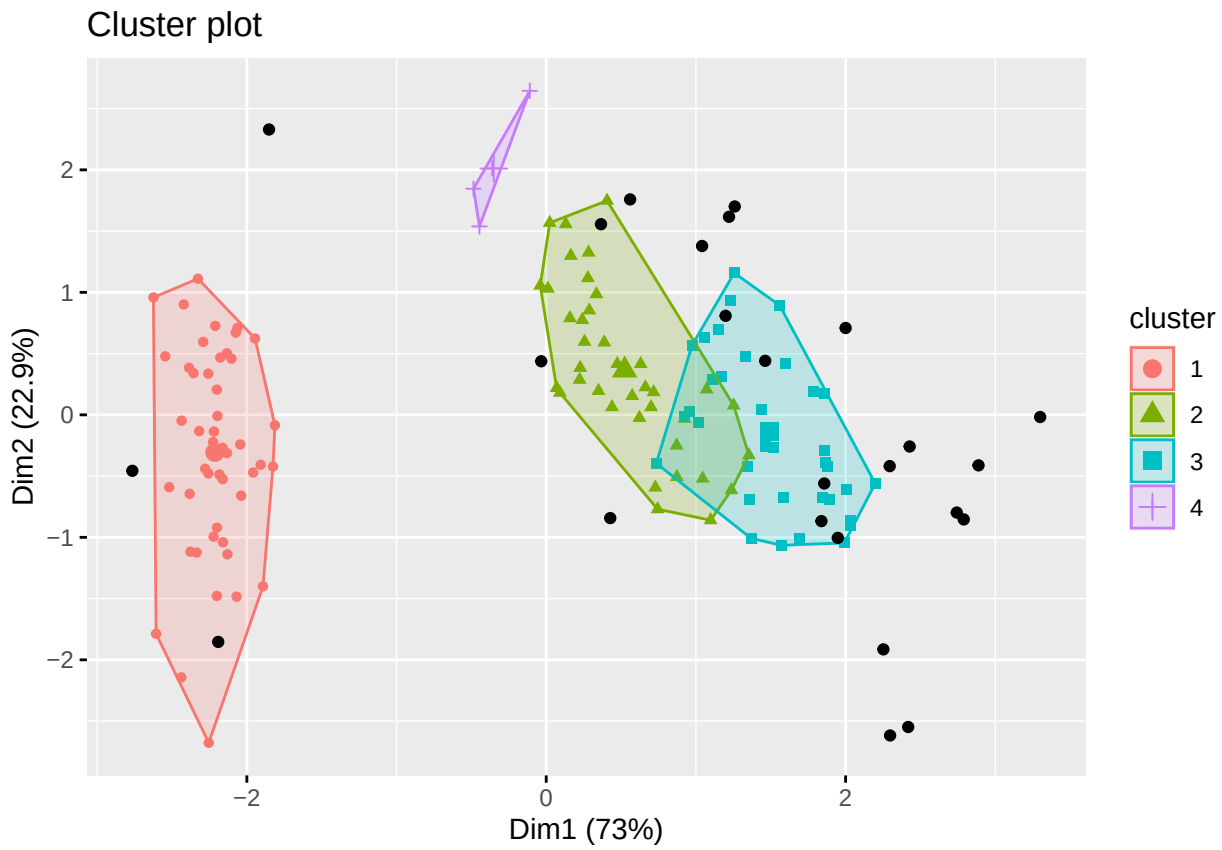
```
db_iris = dbscan(iris[c(-5)], eps = 0.3, MinPts = 4)
db_iris
```

```
## dbscan Pts=150 MinPts=4 eps=0.3
##         0  1 2  3 4 5 6
## border 81  8 3  5 3 3 3
## seed    0 30 1  8 1 1 3
## total  81 38 4 13 4 4 6
```

```
db_iris = dbscan(iris[c(-5)], eps = 0.4, MinPts = 4)
db_iris
```

```
## dbscan Pts=150 MinPts=4 eps=0.4
##         0  1  2  3 4
## border 25  4  7  7 3
## seed    0 43 31 29 1
## total  25 47 38 36 4
```

```
fviz_cluster(db_iris, iris[c(-5)], geom = "point")
```




```
equake = read.csv("equakedata_india.csv")
equake$Magnitude = as.numeric(equake$Magnitude)
```

```
## Warning: NAs introduced by coercion
```

```
equake = na.omit(equake)
db_equake = dbscan(equake, eps = 1, MinPts = 15)
db_equake
```

```
## dbscan Pts=7530 MinPts=15 eps=1
##           0  1   2   3  4  5  6   7  8   9 10 11 12 13 14 15 16 17 18 19  20 21
## border 4940  1  36 105 40 22 14  56  7  12 23 20 14 16 18 13  7 22  9  4   9 12
## seed      0 43 225 490 56 45 50 135 34 109 26 43  5  2  3 12 12 49 22 80 147 19
## total  4940 44 261 595 96 67 64 191 41 121 49 63 19 18 21 25 19 71 31 84 156 31
##        22 23 24  25 26 27 28 29 30 31 32 33 34 35 36
## border 11  5  8  13 15  5 28 14  6 18 22  3 10 17 14
## seed   13 85 23 107  1 21 14  1 10 22  2 24  1  9  1
## total  24 90 31 120 16 26 42 15 16 40 24 27 11 26 15
```

```
db_equake = dbscan(equake, eps = 2.5, MinPts = 15)
db_equake
```

```
## dbscan Pts=7530 MinPts=15 eps=2.5
##           0    1   2   3  4  5  6  7   8  9 10  11 12  13  14 15 16 17 18 19 20
## border 1599  292  70  32 19 11 22 44  27 12 14  20 22  22  32 16  6 24  9 20 12
## seed      0 3757 213 226 34  9 77 14  89 33 45 210 19 140 112 11 27 52 36 20  3
## total  1599 4049 283 258 53 20 99 58 116 45 59 230 41 162 144 27 33 76 45 40 15
##        21 22 23 24
## border 12 17 18 13
## seed    5  3  7  3
## total  17 20 25 16
```

```
db_equake = dbscan(equake, eps = 4, MinPts = 15)
db_equake
```

```
## dbscan Pts=7530 MinPts=15 eps=4
##          0    1   2    3  4  5  6  7  8  9 10 11
## border 433  305  59   82 28 21  8 12  3 16  6 20
## seed     0 4740 332 1271 30 11  3 43 43 38 20  6
## total  433 5045 391 1353 58 32 11 55 46 54 26 26
```

```
db_equake = dbscan(equake, eps = 1, MinPts = 8)
db_equake
```

```
## dbscan Pts=7530 MinPts=8 eps=1
##           0  1  2   3   4  5  6  7   8  9 10 11 12 13  14 15 16  17 18 19 20 21
## border 4166  1  7  25  68  9 12 10  25  6  2  7  5  3  30  8  0  24  4  3  2  1
## seed      0 43 69 306 686 90 34 16 199 20 43 12  9 12 135  1 11 135  8  8  7 10
## total  4166 44 76 331 754 99 46 26 224 26 45 19 14 15 165  9 11 159 12 11  9 11
##        22 23 24 25 26 27 28 29 30 31 32  33 34 35 36 37 38 39 40 41 42 43 44 45
## border  8  5  8  3  3  4 12  6  0 11 12   8  9  7  7  4  3  6  5  1  9  2  4  0
## seed   14 11 10  9 16 11 34  6 84  4 41 159 15  7  1 15  8 21 15 25  6  8 10  8
## total  22 16 18 12 19 15 46 12 84 15 53 167 24 14  8 19 11 27 20 26 15 10 14  8
##        46 47 48 49 50  51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69
## border  3 10  6  5  7   6  0  6  7  9  9  7  9  3 10  5  5  7  1  6  1  3  7  6
## seed   89 35  5 29 14 118 16 13 20 19  4  1  1  7  6  4  3  6 27  1 12 13  1  1
## total  92 45 11 34 21 124 16 19 27 28 13  8 10 10 16  9  8 13 28  7 13 16  8  7
```

```
db_equake = dbscan(equake, eps = 2.5, MinPts = 8)
db_equake
```

```
## dbscan Pts=7530 MinPts=8 eps=2.5
##          0    1   2   3  4  5   6  7  8   9 10  11 12 13 14 15 16 17 18 19 20
## border 870  188  44  45  5  4  34 17  4  33  0  27  9 16 23  3  8  8  6  8  7
## seed     0 4043 270 569 47 17 168 33 11 598 45 146 35  6 23  8  2  1  2  3  3
## total  870 4231 314 614 52 21 202 50 15 631 45 173 44 22 46 11 10  9  8 11 10
```

```
##        21 22 23 24 25 26 27 28 29
## border 11  4  3  8  2  7  7  7  7
## seed   38 20 12  1  9  1  1  1  2
## total  49 24 15  9 11  8  8  8  9
```

```
db_equake = dbscan(equake, eps = 4, MinPts = 8)
db_equake
```

```
## dbscan Pts=7530 MinPts=8 eps=4
##          0    1    2  3  4 5
## border 283  168   35 12  0 8
## seed     0 5482 1416 79 46 1
## total  283 5650 1451 91 46 9
```

```
fviz_cluster(db_equake, equake, geom = "point")
```