Coding Analisis Korespondensi Sederhana

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```
#Import library
library("FactoMineR")
library(factoextra)
```

```
## Warning: package 'factoextra' was built under R version 4.3.3
```

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

```
## Warning: package 'ggplot2' was built under R version 4.3.3
```

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

```
library(gplots)
```

```
## Warning: package 'gplots' was built under R version 4.3.3
```

```
##
## Attaching package: 'gplots'
```

```
## The following object is masked from 'package:stats':
##
##     lowess
```

```
library(vcd)
```

```
## Warning: package 'vcd' was built under R version 4.3.3
```

```
## Loading required package: grid
```

```
library(corrplot)
```

```
## Warning: package 'corrplot' was built under R version 4.3.3
```

```
## corrplot 0.92 loaded
```

```
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.3.3
```

```
library(readr)
```

```
#Import dataset bersih
df <- read.csv("C:\\Users\\Asus\\Downloads\\suicides1.csv")
View(df)
str(df)
```

```
## 'data.frame':    500 obs. of  5 variables:
##  $ country    : chr  "United States" "Guatemala" "Guatemala" "Kiribati"
...
##  $ sex        : chr  "female" "female" "male" "female" ...
##  $ age        : chr  "5-14 years" "5-14 years" "5-14 years" "5-14 years"
...
##  $ generation : chr  "Generation Z" "Generation X" "Generation Z"
"Millenials" ...
##  $ suicides_no: int  151 2 6 1 4 52 195 6 1 2 ...
```

```
### Age & Country ------------------------------------------------------
-------------------------------------------------------------
```

```
#Tabel Kontingensi
# Membuat tabel kontingensi untuk variabel sex dan age
table_age_country <- table(df$country, factor(df$age, levels=c('5-14 years',
'15-24 years', '25-34 years', '35-54 years', '55-74 years', '75+ years')))
table_age_country
```

```
##
##                       5-14 years 15-24 years 25-34 years 35-54 years
##   Albania                     11          13          16           9
##   Guatemala                   26          20          20          23
##   Kiribati                     7           4           6           3
##   Republic of Korea           17          16          21          20
##   United Arab Emirates         2           4           6           3
##   United States               25          16          21          17
##
##                       55-74 years 75+ years
##   Albania                      19         8
##   Guatemala                    26        19
##   Kiribati                      9         3
##   Republic of Korea            21        19
##   United Arab Emirates          5         4
##   United States                23        18
```

```
table_age_country <- as.matrix(unclass(table_age_country))

class(table_age_country)
```

```
## [1] "matrix" "array"
```

```
# Menghitung matriks korespondensi
mat_korespondensi_age_country <- as.matrix(prop.table(table_age_country,
margin = 1))
mat_korespondensi_age_country
```

```
##
##                       5-14 years 15-24 years 25-34 years 35-54 years
##   Albania             0.14473684   0.1710526   0.2105263   0.1184211
##   Guatemala           0.19402985   0.1492537   0.1492537   0.1716418
```

```
##   Kiribati             0.21875000   0.1250000   0.1875000   0.0937500
##   Republic of Korea    0.14912281   0.1403509   0.1842105   0.1754386
##   United Arab Emirates 0.08333333   0.1666667   0.2500000   0.1250000
##   United States        0.20833333   0.1333333   0.1750000   0.1416667
##
##                        55-74 years 75+ years
##   Albania                0.2500000 0.1052632
##   Guatemala              0.1940299 0.1417910
##   Kiribati               0.2812500 0.0937500
##   Republic of Korea      0.1842105 0.1666667
##   United Arab Emirates   0.2083333 0.1666667
##   United States          0.1916667 0.1500000
```

```
# Menghitung jumlah baris
row_sum_age_country <- margin.table(table_age_country, 1)
row_sum_age_country
```

```
##
##              Albania            Guatemala             Kiribati
##                   76                  134                   32
##    Republic of Korea United Arab Emirates        United States
##                  114                   24                  120
```

```
#Menghitung jumlah kolom
column_sum_age_country <- colSums(table_age_country)
column_sum_age_country
```

```
##  5-14 years 15-24 years 25-34 years 35-54 years 55-74 years   75+ years
##          88          73          90          75         103          71
```

```
#Matriks R
Dr <- diag(row_sum_age_country)
# Row profile:
(R <- solve(Dr) %*% mat_korespondensi_age_country)
```

```
##
##         5-14 years 15-24 years 25-34 years 35-54 years 55-74 years   75+
years
##   [1,] 0.001904432 0.002250693 0.002770083 0.001558172 0.003289474
0.001385042
##   [2,] 0.001447984 0.001113834 0.001113834 0.001280909 0.001447984
0.001058142
##   [3,] 0.006835938 0.003906250 0.005859375 0.002929688 0.008789062
0.002929688
##   [4,] 0.001308095 0.001231148 0.001615882 0.001538935 0.001615882
0.001461988
##   [5,] 0.003472222 0.006944444 0.010416667 0.005208333 0.008680556
0.006944444
##   [6,] 0.001736111 0.001111111 0.001458333 0.001180556 0.001597222
0.001250000
```

```r
#Matriks C
Dc <- diag(column_sum_age_country)
# Column profile:
(C <- mat_korespondensi_age_country%*%solve(Dc))
```

```
##
##                              [,1]        [,2]        [,3]        [,4]
##   Albania              0.0016447368 0.002343187 0.002339181 0.001578947
##   Guatemala            0.0022048847 0.002044572 0.001658375 0.002288557
##   Kiribati             0.0024857955 0.001712329 0.002083333 0.001250000
##   Republic of Korea    0.0016945774 0.001922615 0.002046784 0.002339181
##   United Arab Emirates 0.0009469697 0.002283105 0.002777778 0.001666667
##   United States        0.0023674242 0.001826484 0.001944444 0.001888889
##
##                              [,5]        [,6]
##   Albania              0.002427184 0.001482580
##   Guatemala            0.001883785 0.001997057
##   Kiribati             0.002730583 0.001320423
##   Republic of Korea    0.001788452 0.002347418
##   United Arab Emirates 0.002022654 0.002347418
##   United States        0.001860841 0.002112676
```

```r
## Testing Independence
# Melakukan uji chi-square untuk tabel kontingensi 'sex' dan 'age'
chisq.test(table_age_country)
```

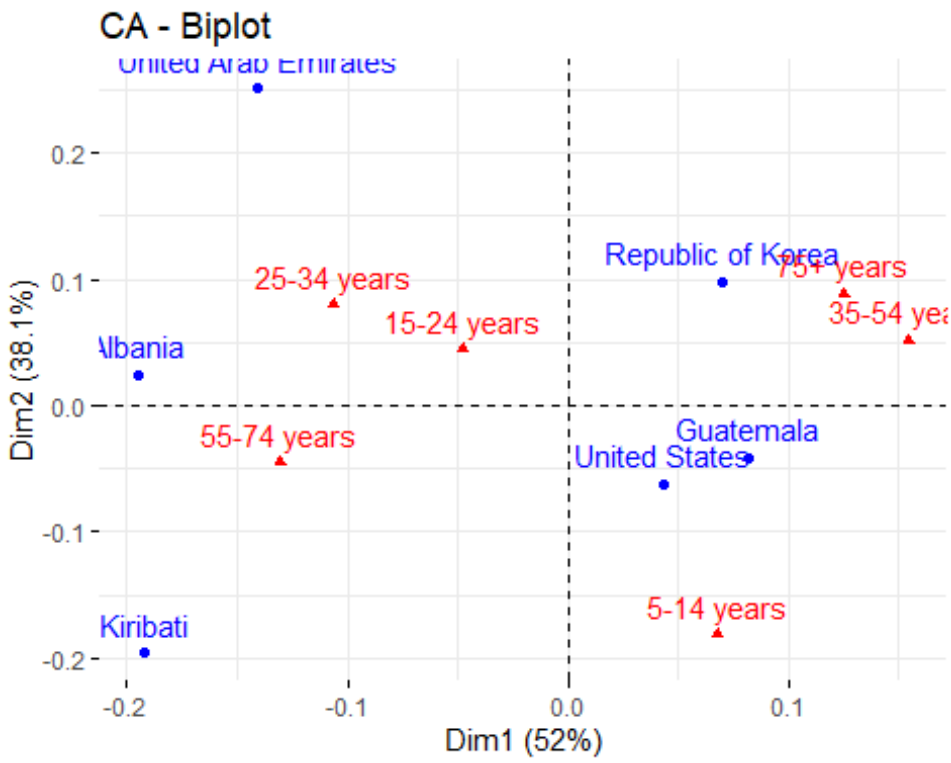
```
## Warning in chisq.test(table_age_country): Chi-squared approximation may be
## incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  table_age_country
## X-squared = 12.011, df = 25, p-value = 0.9865
```

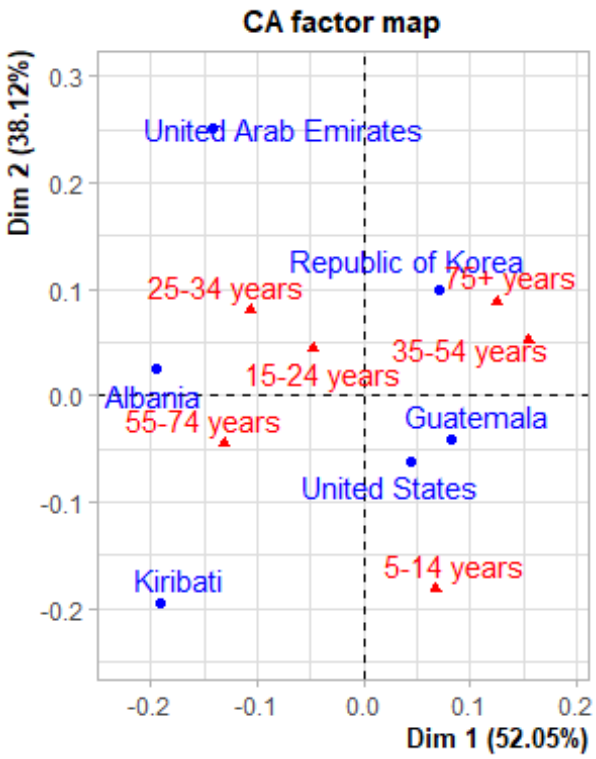
```r
## Coordinates for Plotting Row and Column Profiles
#Manual

#Langsung
res.ca <- CA(table_age_country, graph = FALSE)
print(res.ca)
```

```
## **Results of the Correspondence Analysis (CA)**
## The row variable has  6  categories; the column variable has 6 categories
## The chi square of independence between the two variables is equal to
12.01059 (p-value =  0.9864824 ).
## *The results are available in the following objects:
##
##    name              description
## 1  "$eig"            "eigenvalues"
## 2  "$col"            "results for the columns"
```

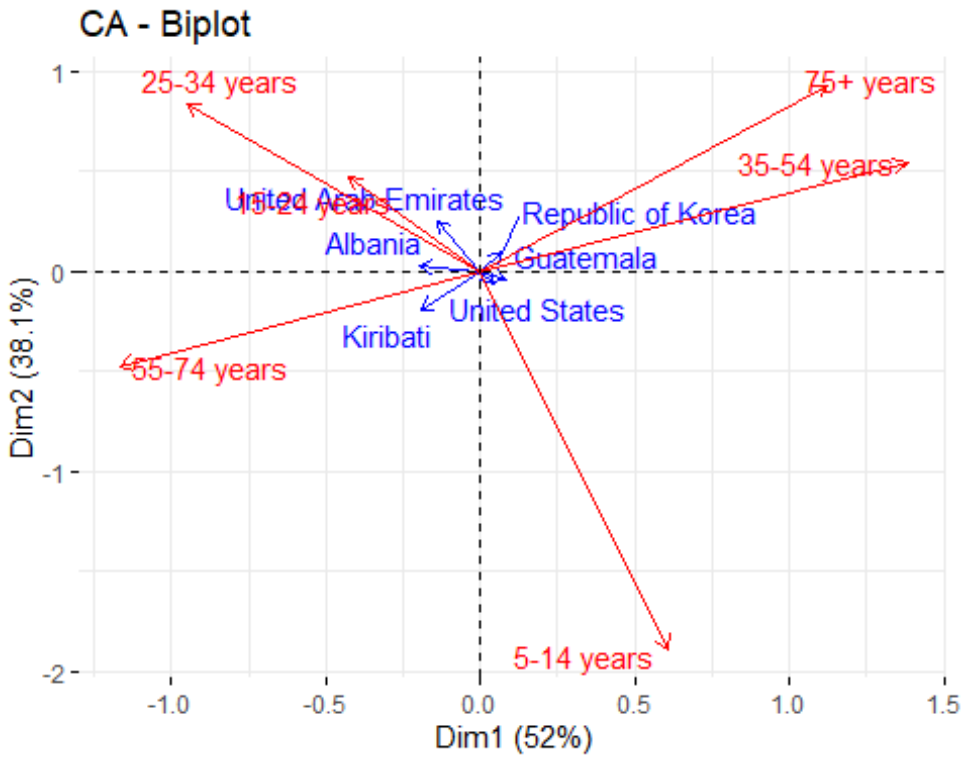
```
## 3  "$col$coord"      "coord. for the columns"
## 4  "$col$cos2"       "cos2 for the columns"
## 5  "$col$contrib"    "contributions of the columns"
## 6  "$row"            "results for the rows"
## 7  "$row$coord"      "coord. for the rows"
## 8  "$row$cos2"       "cos2 for the rows"
## 9  "$row$contrib"    "contributions of the rows"
## 10 "$call"           "summary called parameters"
## 11 "$call$marge.col" "weights of the columns"
## 12 "$call$marge.row" "weights of the rows"

#biplot
fviz_ca_biplot(res.ca, repel = FALSE)
```



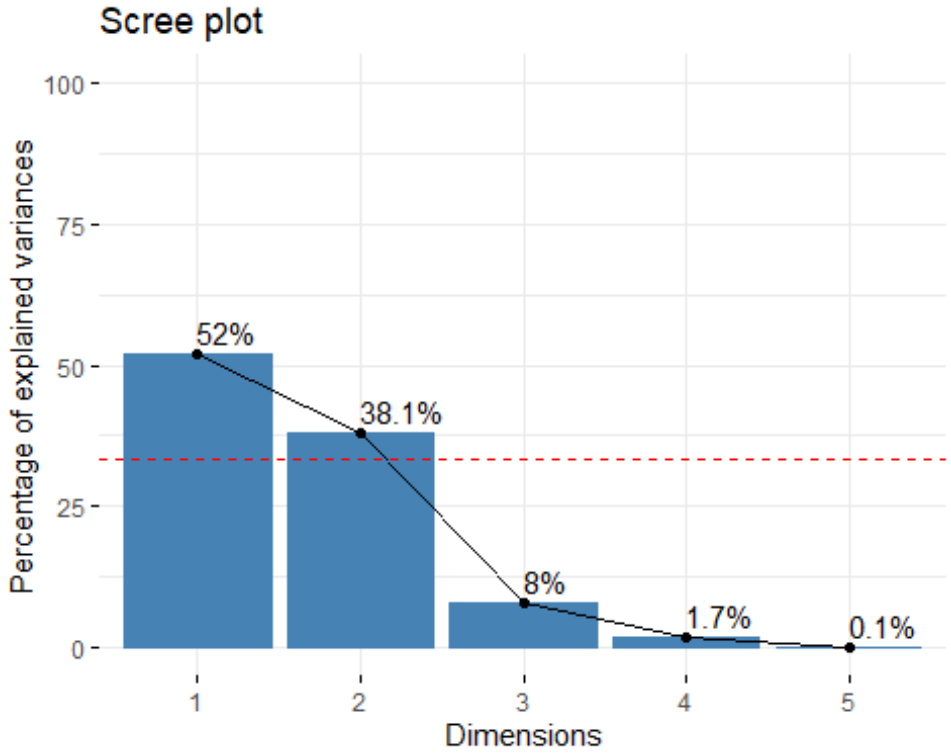

```
ca <- CA(table_age_country, graph = TRUE)
```




```r
#biplot asimetris
fviz_ca_biplot(res.ca,
               map ="rowprincipal", arrow = c(TRUE, TRUE),
               repel = TRUE)
```



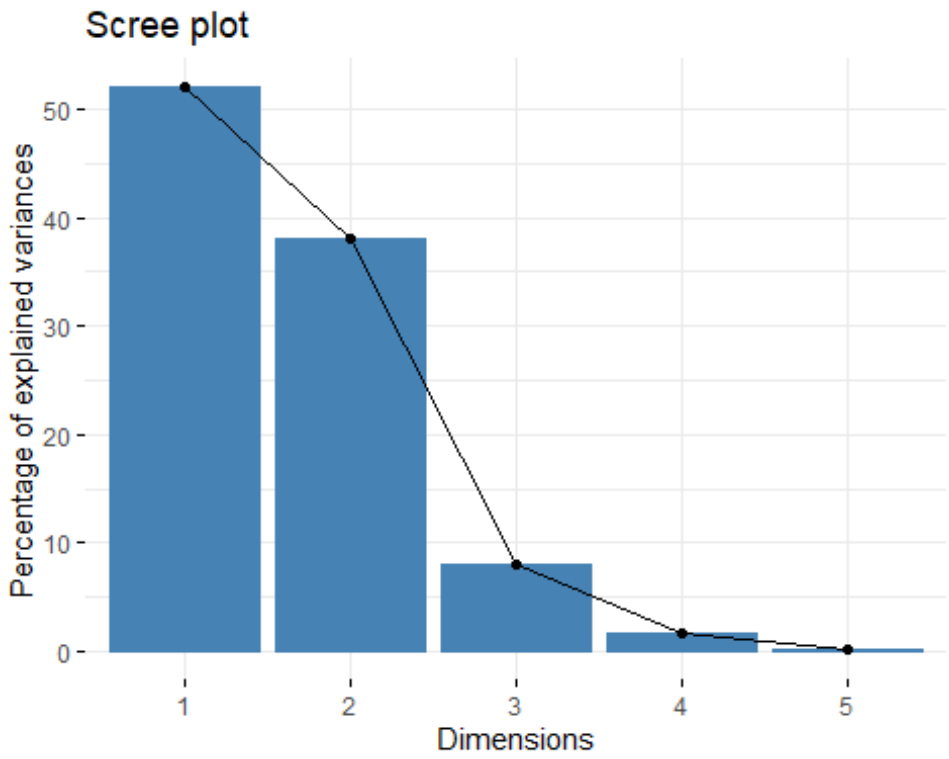

```
#scree plot
fviz_screeplot(res.ca, addlabels = TRUE, ylim = c(0, 100)) +
  geom_hline(yintercept=33.33, linetype=2, color="red")
```



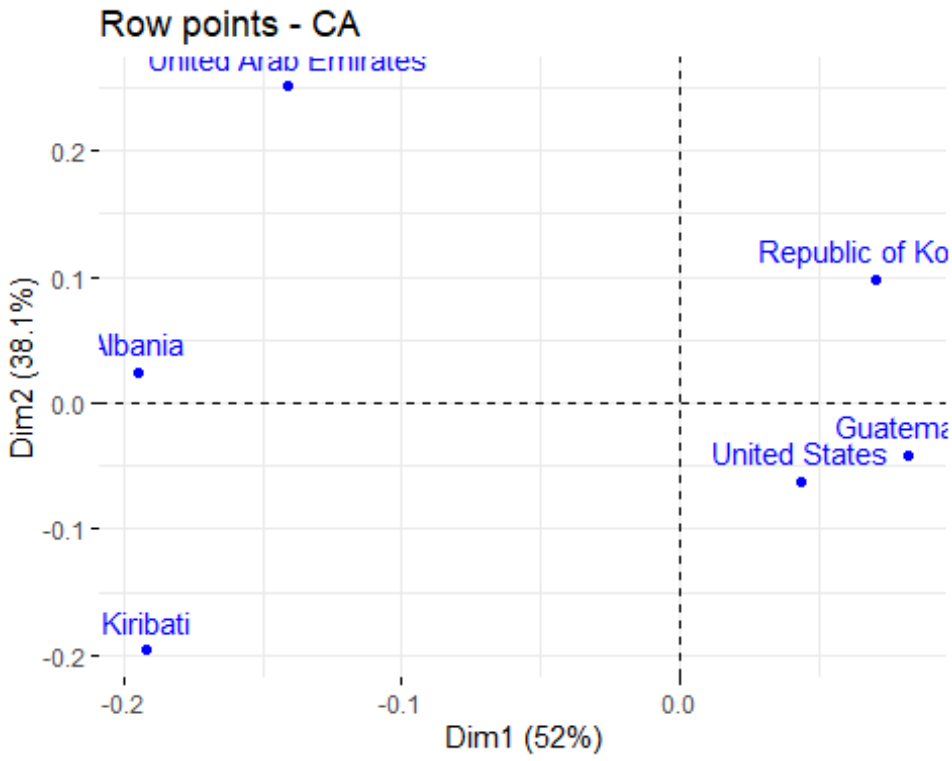
```r
get_eigenvalue(res.ca)
```

```
##         eigenvalue variance.percent cumulative.variance.percent
## Dim.1 1.250254e-02       52.0479856                    52.04799
## Dim.2 9.156306e-03       38.1176455                    90.16563
## Dim.3 1.919558e-03        7.9911070                    98.15674
## Dim.4 4.126965e-04        1.7180531                    99.87479
## Dim.5 3.007663e-05        0.1252088                   100.00000
```

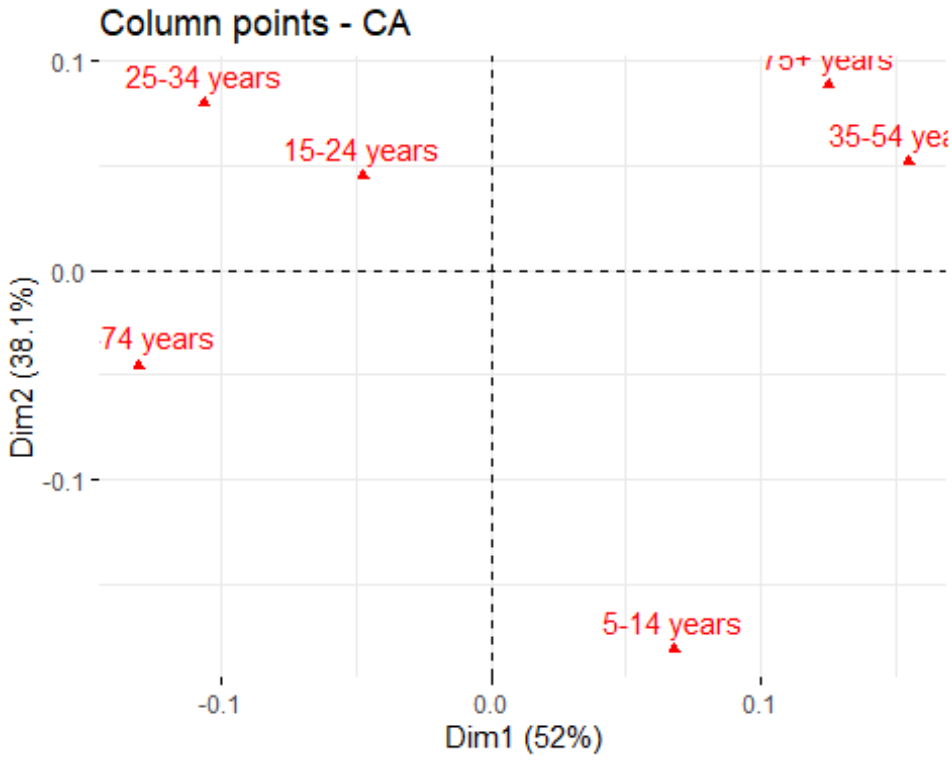
```r
fviz_eig(res.ca)
```



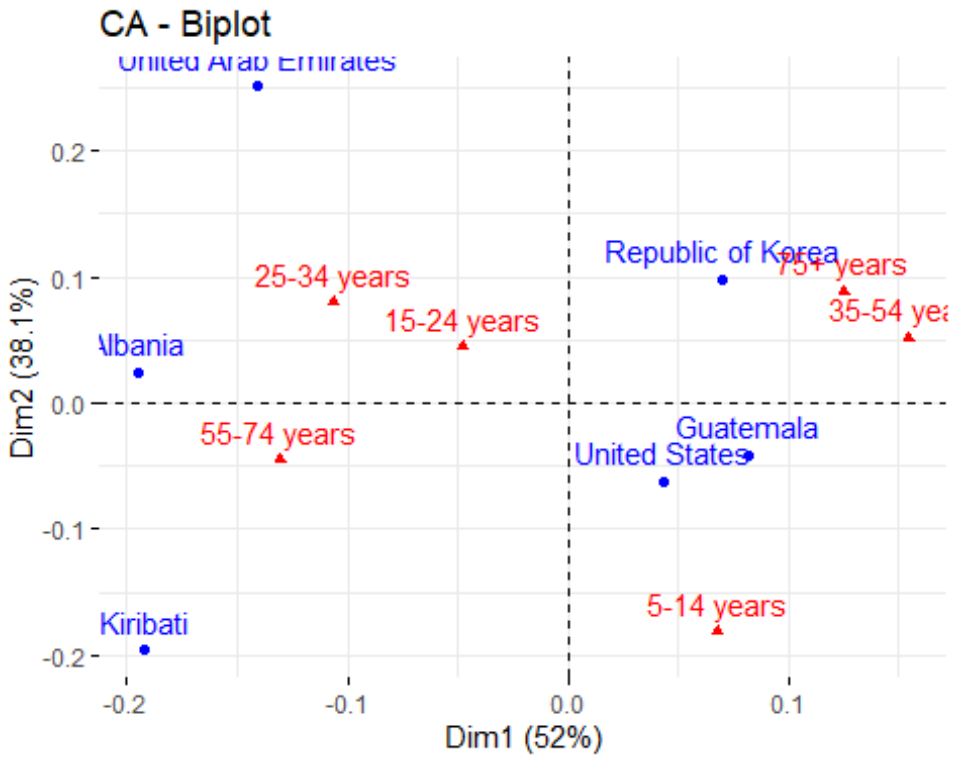

```r
#Visualisasikan hasil masing-masing baris dan kolom.
fviz_ca_row(res.ca)
```




```r
fviz_ca_col(res.ca) #Visualisasikan hasil masing-masing baris dan kolom.
```




```r
fviz_ca_biplot(res.ca)
```




```
row <- get_ca_row(res.ca)
col <- get_ca_col(res.ca)

#Matriks X1 (row profiles)
head(row$coord)
```

```
##                          Dim 1       Dim 2        Dim 3       Dim 4
## Albania              -0.19487382  0.02441646  0.042438378  0.01315205
## Guatemala             0.08243001 -0.04100665  0.049698555  0.00486188
## Kiribati             -0.19202153 -0.19540874 -0.035469016 -0.04840991
## Republic of Korea     0.07037374  0.09866519 -0.006416446 -0.02412272
## United Arab Emirates -0.14116460  0.25166632 -0.059774800  0.01783792
## United States         0.04395686 -0.06162921 -0.054865372  0.01849958
##                             Dim 5
## Albania              -0.005801377
## Guatemala             0.004456157
## Kiribati              0.005936077
## Republic of Korea    -0.003859305
## United Arab Emirates  0.016166705
## United States        -0.002451792
```

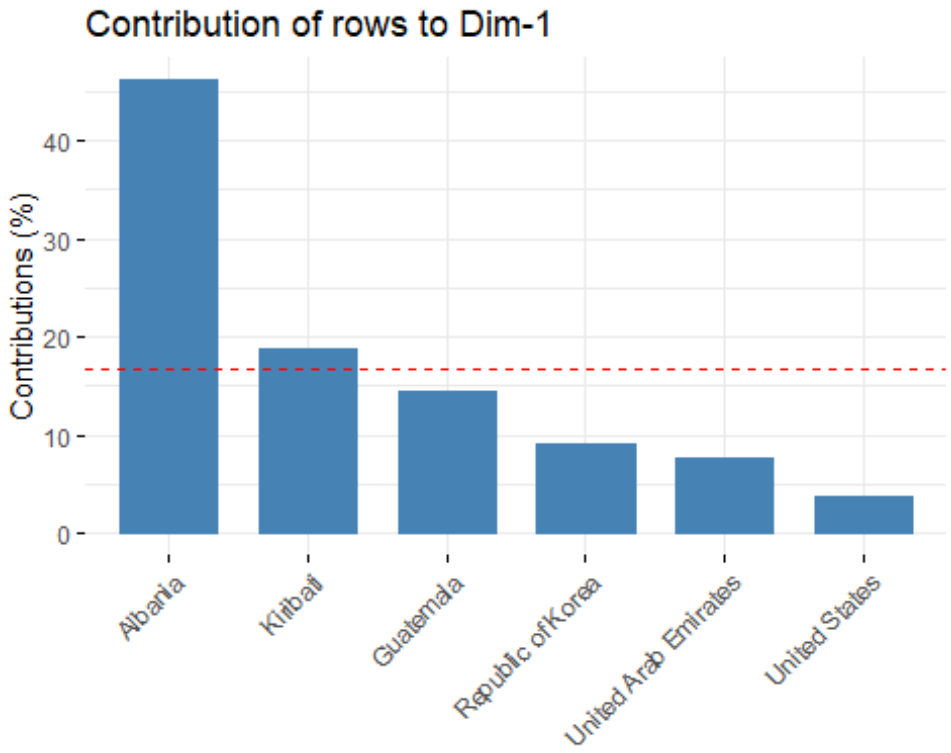
```
ca$row$coord[, 1:2]
```

```
##                          Dim 1       Dim 2
## Albania              -0.19487382  0.02441646
## Guatemala             0.08243001 -0.04100665
## Kiribati             -0.19202153 -0.19540874
```

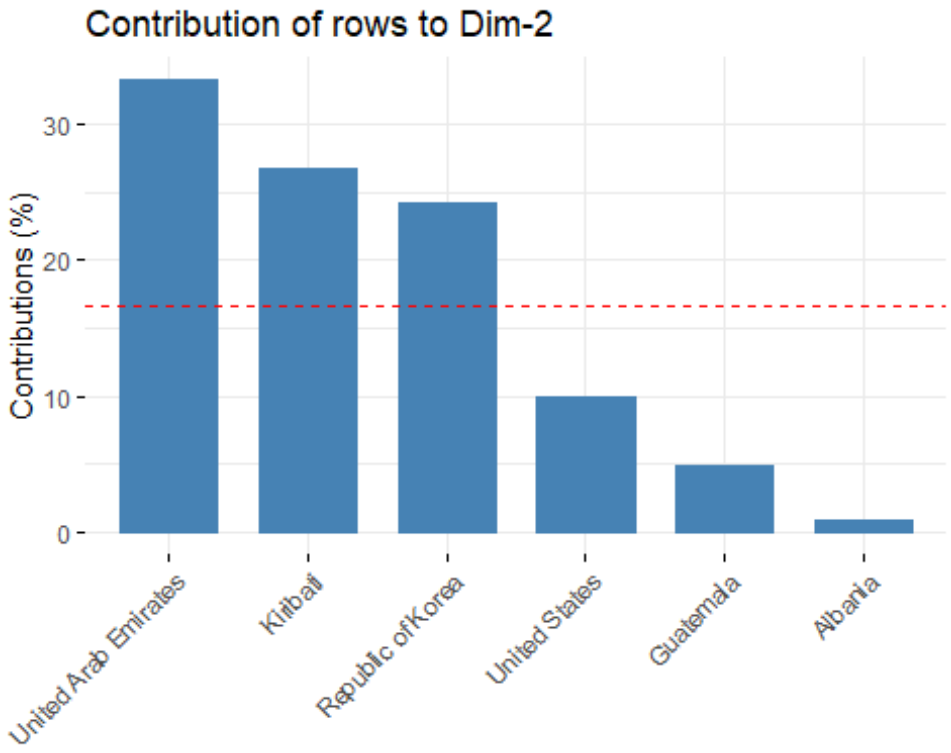
```
## Republic of Korea     0.07037374  0.09866519
## United Arab Emirates -0.14116460  0.25166632
## United States         0.04395686 -0.06162921

#Matriks Y (column profiles)
ca$col$coord[, 1:2]

##                   Dim 1       Dim 2
## 5-14 years   0.06792518 -0.18116795
## 15-24 years -0.04756088  0.04507877
## 25-34 years -0.10608373  0.07963700
## 35-54 years  0.15468547  0.05169204
## 55-74 years -0.13064111 -0.04546602
## 75+ years    0.12530548  0.08860277

#kontribusi
#Baris
head(row$cos2, 6)

##                           Dim 1      Dim 2       Dim 3       Dim 4
Dim 5
## Albania              0.9358345 0.01469121 0.044382278 0.004262642
0.0008293811
## Guatemala            0.6182799 0.15301111 0.224751174 0.002150913
0.0018069053
## Kiribati             0.4685546 0.48523069 0.015986691 0.029780283
0.0004477745
## Republic of Korea    0.3231570 0.63521430 0.002686466 0.037970374
0.0009718752
## United Arab Emirates 0.2279612 0.72453516 0.040873848 0.003639970
0.0029898698
## United States        0.2125914 0.41789358 0.331199140 0.037654441
0.0006613932

head(row$contrib)

##                           Dim 1      Dim 2      Dim 3     Dim 4     Dim 5
## Albania              46.169210  0.9896665 14.2613280  6.370882 17.008913
## Guatemala            14.564894  4.9217893 34.4842789  1.535014 17.694023
## Kiribati             18.874770 26.6899420  4.1944698 36.342741  7.498077
## Republic of Korea     9.031459 24.2405513  0.4890156 32.148195 11.290779
## United Arab Emirates  7.650585 33.2025274  8.9346249  3.700829 41.711434
## United States         3.709081  9.9555234 37.6362828 19.902338  4.796774

head(col$contrib)

##                  Dim 1     Dim 2     Dim 3       Dim 4     Dim 5
## 5-14 years   6.494954 63.089216  4.947576  5.49411560  2.374139
## 15-24 years  2.641523  3.240236 25.224147 50.36619695  3.927896
## 25-34 years 16.202124 12.467576 20.729338  0.49388638 32.107075
## 35-54 years 28.707285  4.377422 22.992125 13.61239129 15.310776
```

```
## 55-74 years 28.120871  4.650727  3.696024 29.98972579 12.942651
## 75+ years   17.833242 12.174823 22.410790  0.04368399 33.337461
```

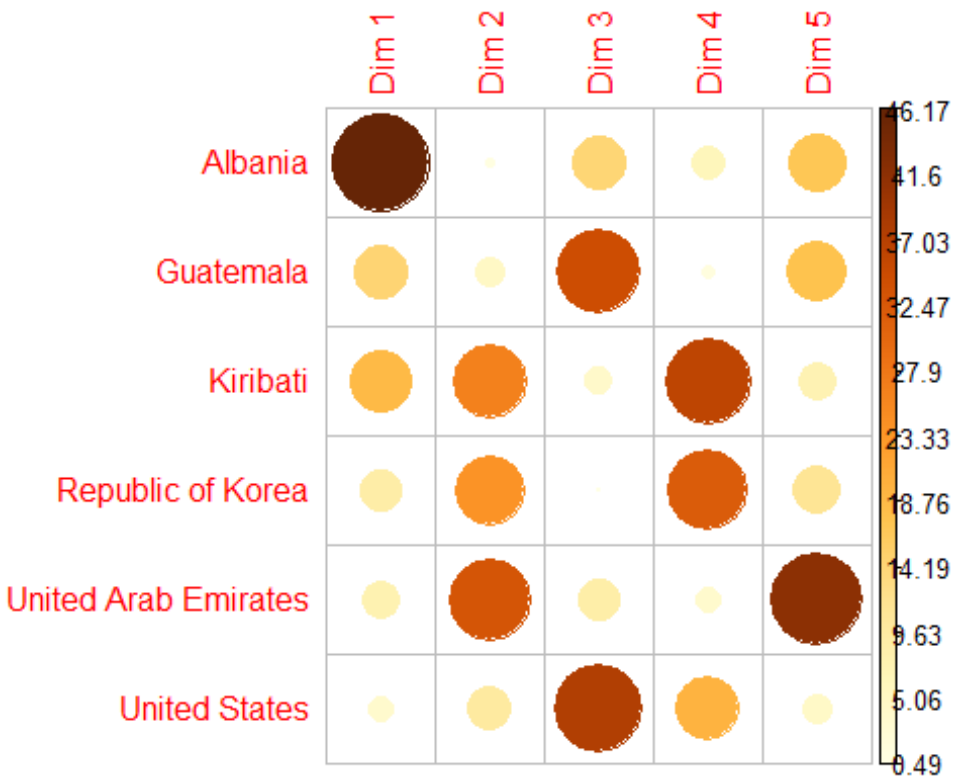
```r
# Contributions of rows to dimension 1
fviz_contrib(res.ca, choice = "row", axes = 1, top = 10)
```



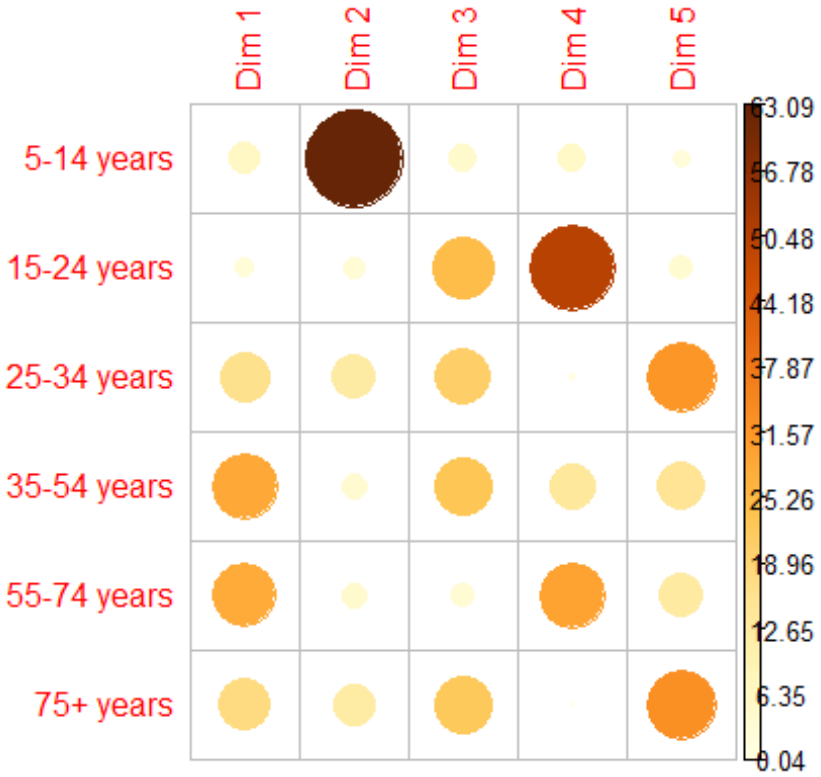

```r
# Contributions of rows to dimension 2
fviz_contrib(res.ca, choice = "row", axes = 2, top = 10)
```



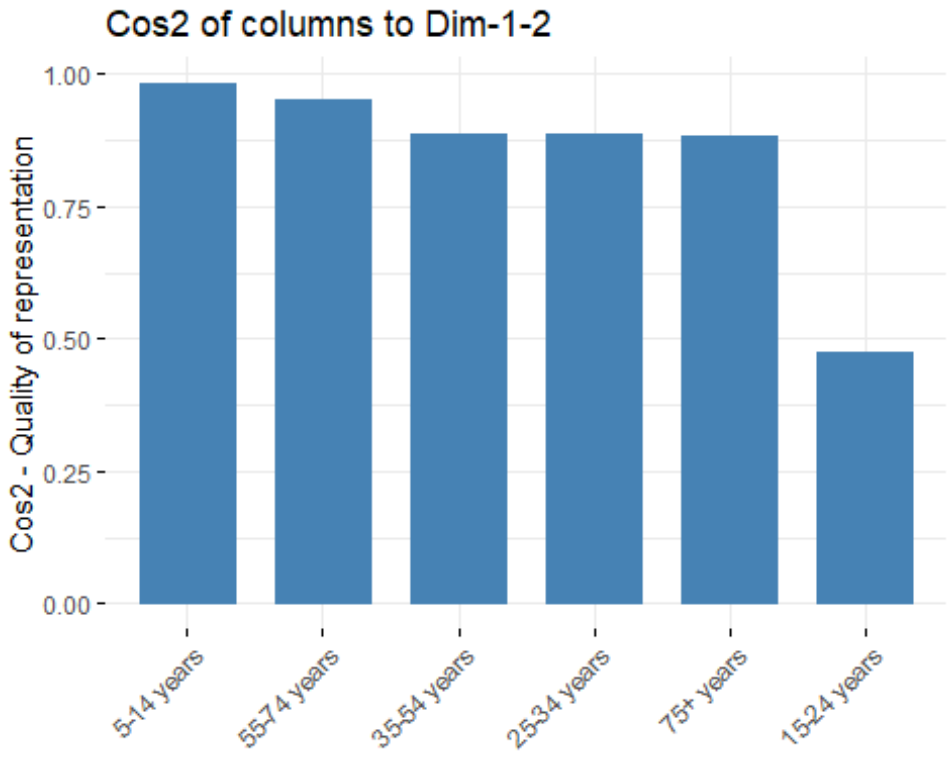

```
corrplot(ca$row$contrib, is.corr = FALSE)
```



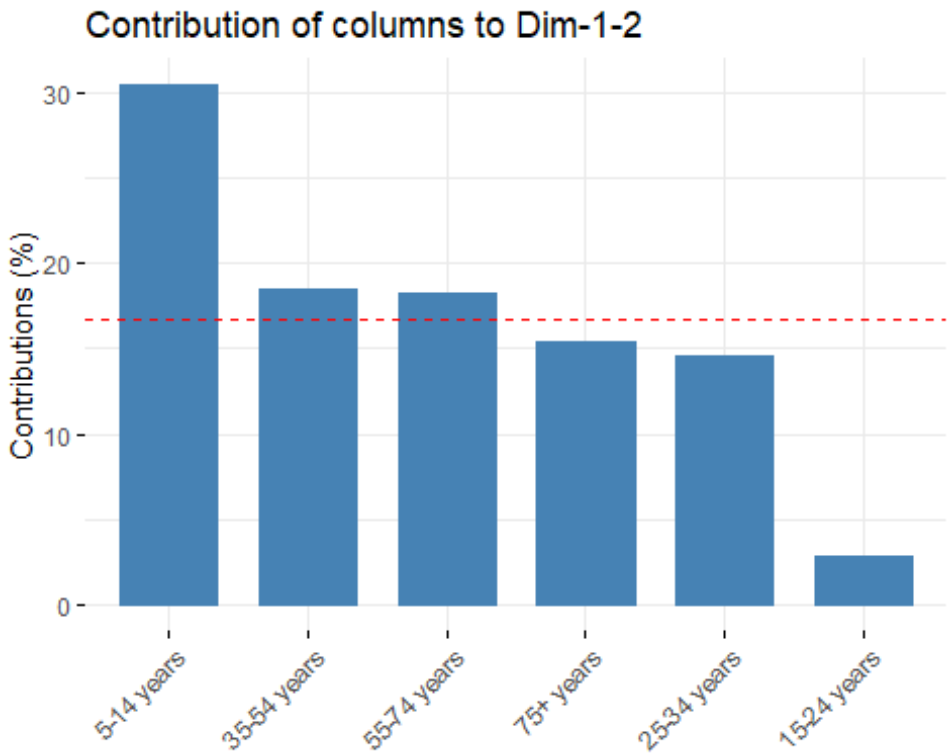
```r
#Kolom
corrplot(ca$col$contrib, is.corr = FALSE)
```



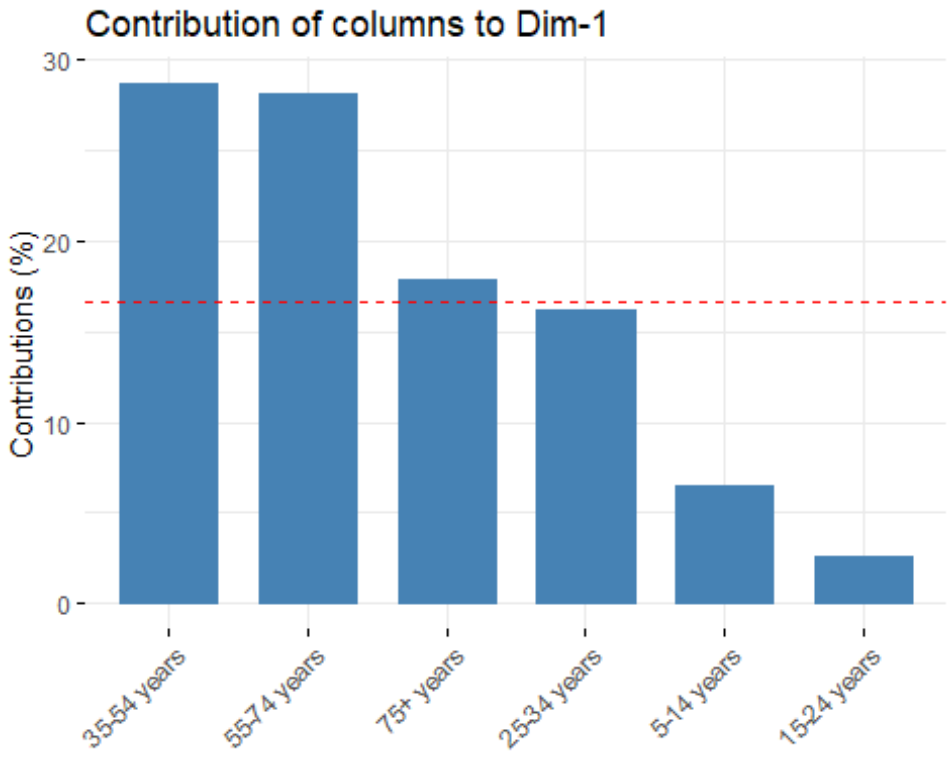

```r
fviz_cos2(res.ca, choice = "col", axes = 1:2)
```




```
fviz_contrib(res.ca, choice = "col", axes = 1:2)
```




```
fviz_contrib(res.ca, choice = "col", axes = 1, top = 10)
```




```
ca$col$contrib
```

```
##                  Dim 1     Dim 2     Dim 3       Dim 4     Dim 5
## 5-14 years    6.494954 63.089216  4.947576  5.49411560  2.374139
## 15-24 years   2.641523  3.240236 25.224147 50.36619695  3.927896
## 25-34 years  16.202124 12.467576 20.729338  0.49388638 32.107075
## 35-54 years  28.707285  4.377422 22.992125 13.61239129 15.310776
## 55-74 years  28.120871  4.650727  3.696024 29.98972579 12.942651
## 75+ years    17.833242 12.174823 22.410790  0.04368399 33.337461
```

```
###Age & Generation ------------------------------------------------------
-------------------------------------------------
urutan_age <- c('5-14 years', '15-24 years', '25-34 years', '35-54 years',
'55-74 years', '75+ years')
urutan_generation <- c('G.I. Generation', 'Silent', 'Boomers', 'Generation
X', 'Millenials', 'Generation Z')

table_age_generation <- table(factor(df$age, levels=urutan_age),
factor(df$generation, levels=urutan_generation))
# Menampilkan tabel kontingensi yang sudah diurutkan
print(table_age_generation)
```

```
##
##                G.I. Generation Silent Boomers Generation X Millenials
##   5-14 years                 0      0       0           17         51
##   15-24 years                0      0       0           36         37
##   25-34 years                0      0      29           49         12
```

```
##   35-54 years               0     12      45           18          0
##   55-74 years              15     72      16            0          0
##   75+ years                32     39       0            0          0
##
##               Generation Z
##   5-14 years            20
##   15-24 years            0
##   25-34 years            0
##   35-54 years            0
##   55-74 years            0
##   75+ years              0
```

```
#Ubah tipe menjadi matriks
as.matrix(unclass(table_age_generation))
```

```
##
##               G.I. Generation Silent Boomers Generation X Millenials
##   5-14 years                0      0       0           17         51
##   15-24 years               0      0       0           36         37
##   25-34 years               0      0      29           49         12
##   35-54 years               0     12      45           18          0
##   55-74 years              15     72      16            0          0
##   75+ years                32     39       0            0          0
##
##               Generation Z
##   5-14 years            20
##   15-24 years            0
##   25-34 years            0
##   35-54 years            0
##   55-74 years            0
##   75+ years              0
```

```
# Menghitung matriks korespondensi
mat_korespondensi_age_generation <-
as.matrix(prop.table(table_age_generation, margin = 1))
mat_korespondensi_age_generation
```

```
##
##               G.I. Generation    Silent   Boomers Generation X Millenials
##   5-14 years        0.0000000 0.0000000 0.0000000    0.1931818  0.5795455
##   15-24 years       0.0000000 0.0000000 0.0000000    0.4931507  0.5068493
##   25-34 years       0.0000000 0.0000000 0.3222222    0.5444444  0.1333333
##   35-54 years       0.0000000 0.1600000 0.6000000    0.2400000  0.0000000
##   55-74 years       0.1456311 0.6990291 0.1553398    0.0000000  0.0000000
##   75+ years         0.4507042 0.5492958 0.0000000    0.0000000  0.0000000
##
##               Generation Z
##   5-14 years     0.2272727
##   15-24 years    0.0000000
##   25-34 years    0.0000000
##   35-54 years    0.0000000
```

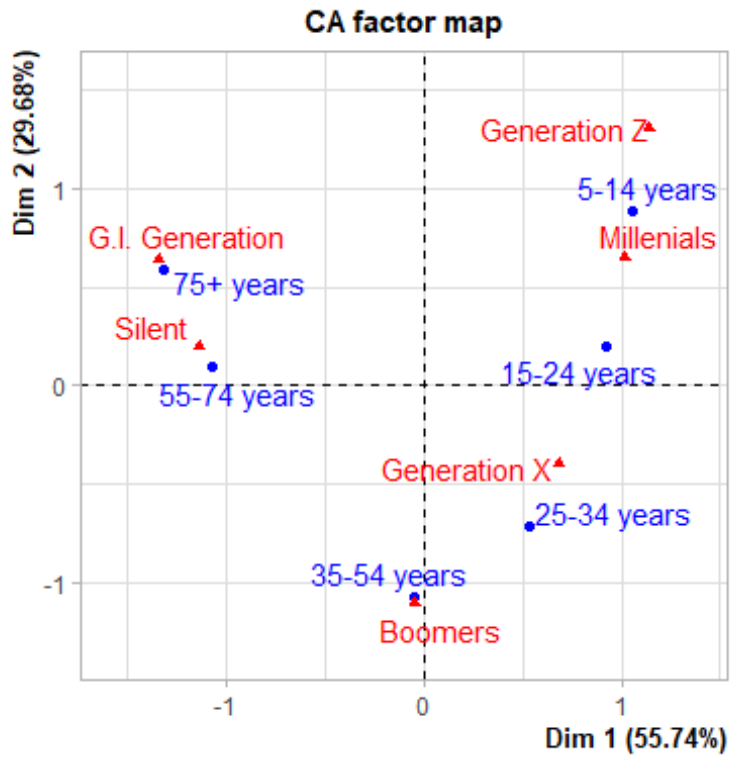
```
##   55-74 years    0.0000000
##   75+ years      0.0000000

# Menghitung jumlah baris
row_sum_age_generation <- margin.table(table_age_generation, 1)
row_sum_age_generation

##
##  5-14 years 15-24 years 25-34 years 35-54 years 55-74 years   75+ years
##          88          73          90          75         103          71

#Menghitung jumlah kolom
column_sum_age_generation <- colSums(table_age_generation)
column_sum_age_generation

## G.I. Generation          Silent         Boomers    Generation X
Millenials
##              47             123              90             120
100
##    Generation Z
##              20

#Matriks R
Dr <- diag(row_sum_age_generation)
# Row profile:
(R <- solve(Dr) %*% mat_korespondensi_age_generation)

##
##        G.I. Generation      Silent     Boomers Generation X  Millenials
##   [1,]     0.000000000 0.000000000 0.000000000  0.002195248 0.006585744
##   [2,]     0.000000000 0.000000000 0.000000000  0.006755489 0.006943141
##   [3,]     0.000000000 0.000000000 0.003580247  0.006049383 0.001481481
##   [4,]     0.000000000 0.002133333 0.008000000  0.003200000 0.000000000
##   [5,]     0.001413894 0.006786691 0.001508153  0.000000000 0.000000000
##   [6,]     0.006347947 0.007736560 0.000000000  0.000000000 0.000000000
##
##        Generation Z
##   [1,]  0.002582645
##   [2,]  0.000000000
##   [3,]  0.000000000
##   [4,]  0.000000000
##   [5,]  0.000000000
##   [6,]  0.000000000

#Matriks C
Dc <- diag(column_sum_age_generation)
# Column profile:
(C <- mat_korespondensi_age_generation%*%solve(Dc))

##
##                      [,1]        [,2]        [,3]        [,4]        [,5]
##   5-14 years  0.000000000 0.000000000 0.000000000 0.001609848 0.005795455
```

```
##   15-24 years 0.000000000 0.000000000 0.000000000 0.004109589 0.005068493
##   25-34 years 0.000000000 0.000000000 0.003580247 0.004537037 0.001333333
##   35-54 years 0.000000000 0.001300813 0.006666667 0.002000000 0.000000000
##   55-74 years 0.003098533 0.005683164 0.001725998 0.000000000 0.000000000
##   75+ years   0.009589452 0.004465819 0.000000000 0.000000000 0.000000000
##
##                     [,6]
##   5-14 years  0.01136364
##   15-24 years 0.00000000
##   25-34 years 0.00000000
##   35-54 years 0.00000000
##   55-74 years 0.00000000
##   75+ years   0.00000000
```

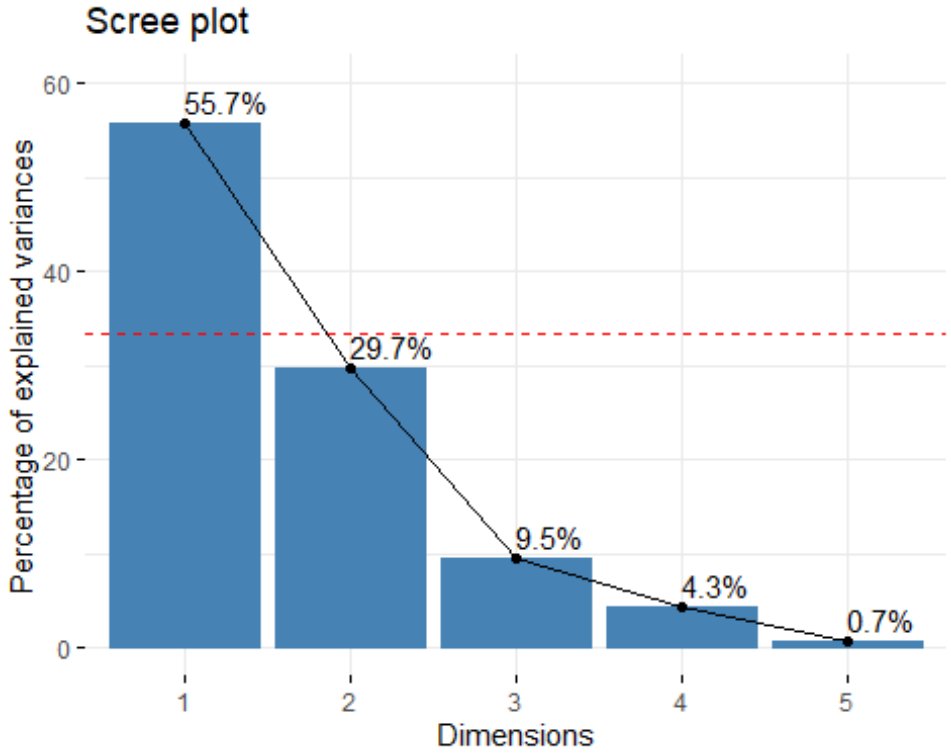
```
## Testing Independence
# Melakukan uji chi-square untuk tabel kontingensi 'sex' dan 'age'
chisq.test(table_age_generation)
```

```
## Warning in chisq.test(table_age_generation): Chi-squared approximation may
be
## incorrect

##
##  Pearson's Chi-squared test
##
## data:  table_age_generation
## X-squared = 771.88, df = 25, p-value < 2.2e-16
```

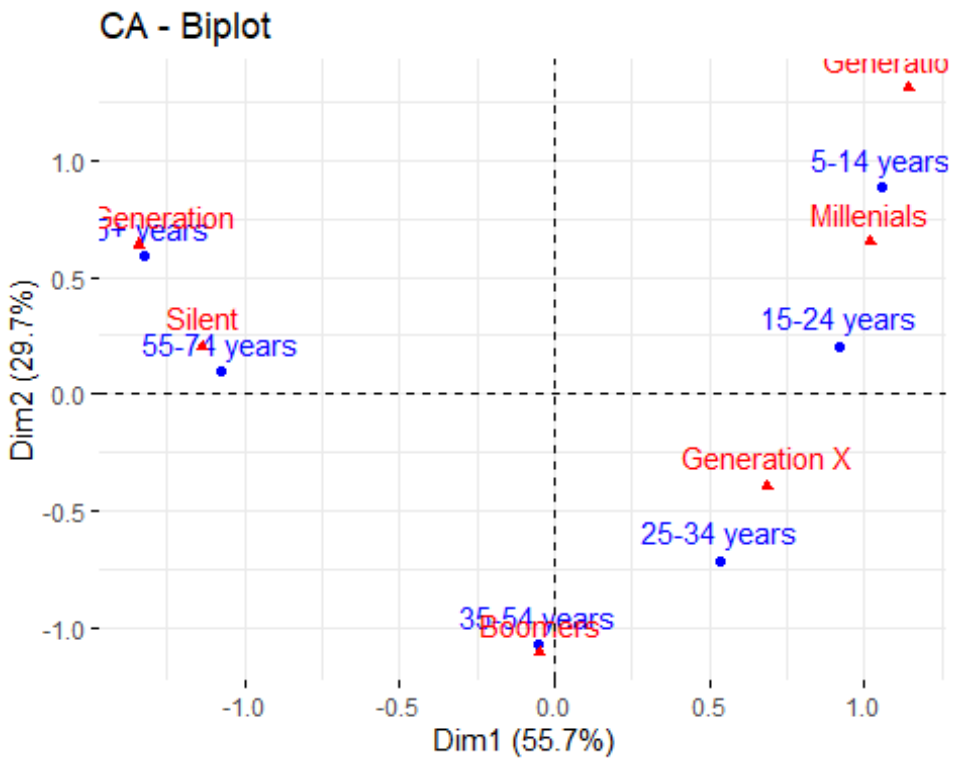
```
## Coordinates for Plotting Row and Column Profiles
res.ca <- CA(table_age_generation)
```



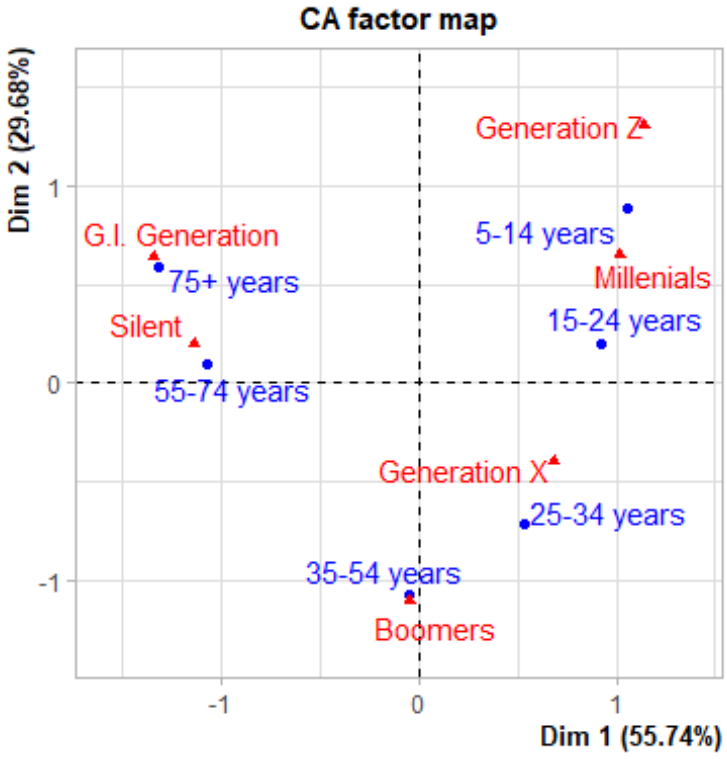

```r
#scree plot
fviz_screeplot(res.ca, addlabels = TRUE, ylim = c(0, 60)) +
  geom_hline(yintercept=33.33, linetype=2, color="red")
```



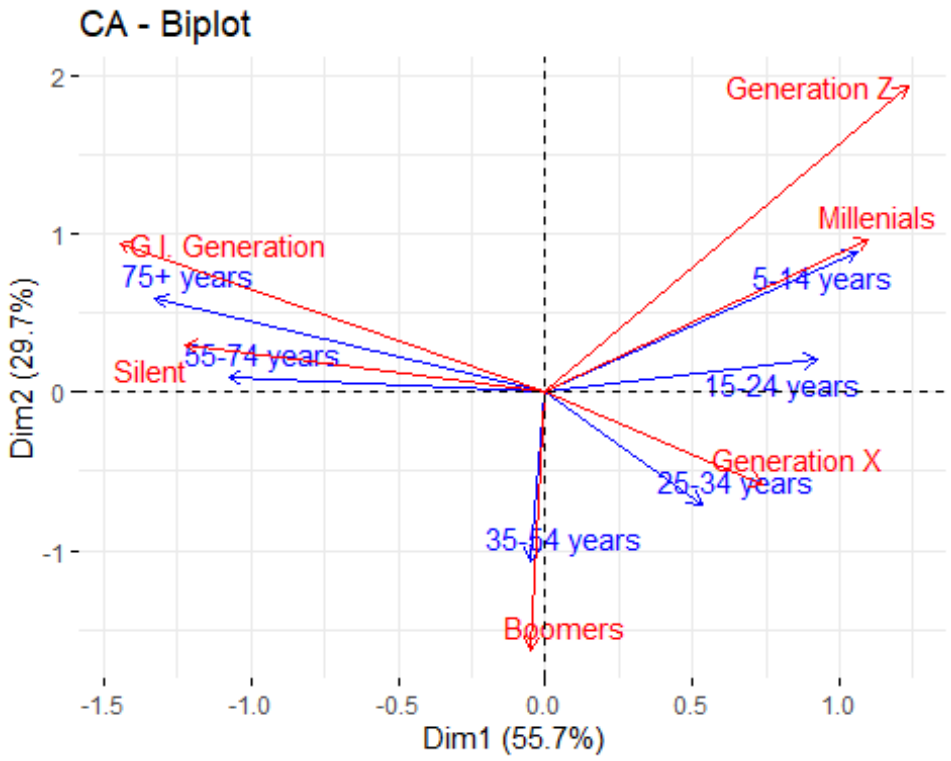
```
fviz_ca_biplot(res.ca, repel = FALSE)
```




```
ca <- CA(table_age_generation, graph = TRUE)
```



```
fviz_ca_biplot(res.ca,
               map ="rowprincipal", arrow = c(TRUE, TRUE),
               repel = TRUE)
```



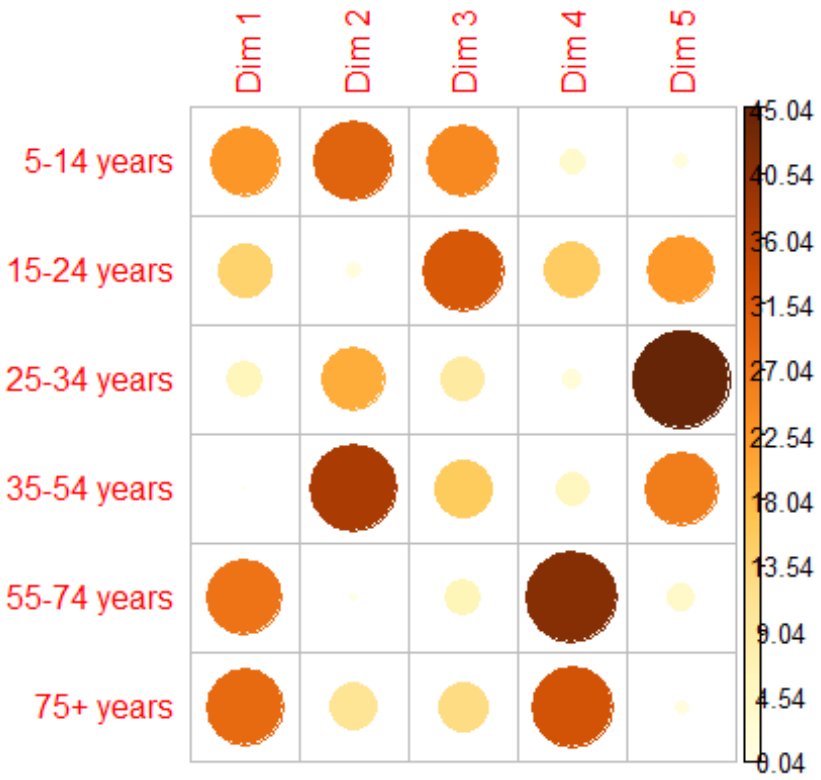

```
#Matriks Y (column profiles)
ca$row$coord[, 1:2]
```

```
##                    Dim 1       Dim 2
## 5-14 years    1.05942136  0.88545558
## 15-24 years   0.92178621  0.20275556
## 25-34 years   0.53301699 -0.71224829
## 35-54 years  -0.04895547 -1.06958683
## 55-74 years  -1.07505381  0.09419745
## 75+ years    -1.32519435  0.59010951
```

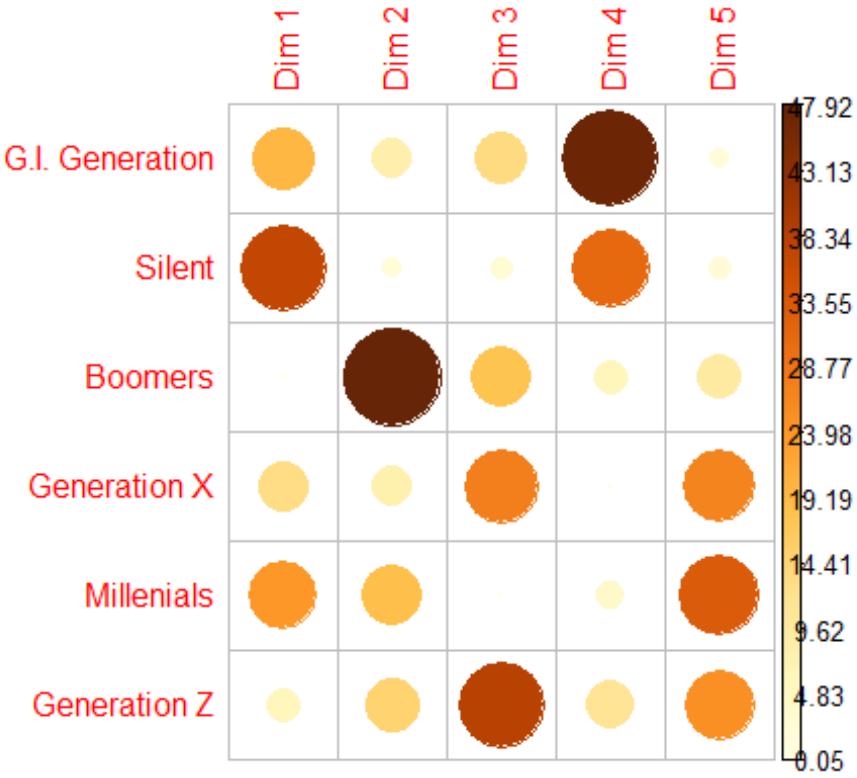
```
ca$col$coord[, 1:2]
```

```
##                        Dim 1      Dim 2
## G.I. Generation -1.34248279  0.6379735
## Silent          -1.13647674  0.2037219
## Boomers         -0.04726805 -1.1043836
## Generation X     0.68659699 -0.3915044
## Millenials       1.01904994  0.6517015
## Generation Z     1.14204115  1.3081177
```

```
#kontribusi
#Baris
corrplot(ca$row$contrib, is.corr = FALSE)
```




```r
#Kolom
corrplot(ca$col$contrib, is.corr = FALSE)
```



```r
###Generation & Country ------------------------------------------------
-----------------------------------------
urutan_generation <- c('G.I. Generation', 'Silent', 'Boomers', 'Generation
X', 'Millenials', 'Generation Z')
table_generation_country <- table(df$country, factor(df$generation,
levels=urutan_generation))

# Menampilkan tabel kontingensi yang sudah diurutkan
print(table_generation_country)
```

```
##
##                         G.I. Generation Silent Boomers Generation X
Millenials
##   Albania                             4     25      11           18
16
##   Guatemala                          14     28      27           32
28
##   Kiribati                            3      9       6            7
7
##   Republic of Korea                  12     27      23           23
23
##   United Arab Emirates                0      9       3            6
5
##   United States                      14     25      20           34
21
##
##                         Generation Z
##   Albania                          2
##   Guatemala                        5
##   Kiribati                         0
##   Republic of Korea                6
##   United Arab Emirates             1
##   United States                    6
```

```r
class(table_generation_country)
```

```
## [1] "table"
```

```r
#Mengubah tipe menjadi matriks
as.matrix(unclass(table_generation_country))
```

```
##
##                         G.I. Generation Silent Boomers Generation X
Millenials
##   Albania                             4     25      11           18
16
##   Guatemala                          14     28      27           32
28
##   Kiribati                            3      9       6            7
7
##   Republic of Korea                  12     27      23           23
```

```
23
##   United Arab Emirates               0      9       3            6
5
##   United States                     14     25      20           34
21
##
##                         Generation Z
##   Albania                           2
##   Guatemala                         5
##   Kiribati                          0
##   Republic of Korea                 6
##   United Arab Emirates              1
##   United States                     6
```

```
# Menghitung matriks korespondensi
mat_korespondensi_generation_country <-
as.matrix(prop.table(table_generation_country, margin = 1))
mat_korespondensi_generation_country
```

```
##
##                         G.I. Generation     Silent    Boomers Generation X
##   Albania                        0.05263158 0.32894737 0.14473684   0.23684211
##   Guatemala                      0.10447761 0.20895522 0.20149254   0.23880597
##   Kiribati                       0.09375000 0.28125000 0.18750000   0.21875000
##   Republic of Korea              0.10526316 0.23684211 0.20175439   0.20175439
##   United Arab Emirates           0.00000000 0.37500000 0.12500000   0.25000000
##   United States                  0.11666667 0.20833333 0.16666667   0.28333333
##
##                         Millenials Generation Z
##   Albania               0.21052632   0.02631579
##   Guatemala             0.20895522   0.03731343
##   Kiribati              0.21875000   0.00000000
##   Republic of Korea     0.20175439   0.05263158
##   United Arab Emirates  0.20833333   0.04166667
##   United States         0.17500000   0.05000000
```

```
# Menghitung jumlah baris
row_sum_generation_country <- margin.table(table_generation_country, 1)
row_sum_generation_country
```

```
##
##              Albania            Guatemala             Kiribati
##                   76                  134                   32
##    Republic of Korea United Arab Emirates        United States
##                  114                   24                  120
```

```
#Menghitung jumlah kolom
column_sum_generation_country <- colSums(table_generation_country)
column_sum_generation_country
```

```
## G.I. Generation          Silent         Boomers    Generation X
Millenials
##              47             123              90             120
100
##    Generation Z
##              20
```

```
#Matriks R
Dr <- diag(row_sum_generation_country)
# Row profile:
(R <- solve(Dr) %*% mat_korespondensi_generation_country)
```

```
##
##        G.I. Generation      Silent     Boomers Generation X  Millenials
##   [1,]    0.0006925208 0.004328255 0.001904432  0.003116343 0.002770083
##   [2,]    0.0007796837 0.001559367 0.001503676  0.001782134 0.001559367
##   [3,]    0.0029296875 0.008789062 0.005859375  0.006835938 0.006835938
##   [4,]    0.0009233610 0.002077562 0.001769775  0.001769775 0.001769775
##   [5,]    0.0000000000 0.015625000 0.005208333  0.010416667 0.008680556
##   [6,]    0.0009722222 0.001736111 0.001388889  0.002361111 0.001458333
##
##        Generation Z
##   [1,] 0.0003462604
##   [2,] 0.0002784585
##   [3,] 0.0000000000
##   [4,] 0.0004616805
##   [5,] 0.0017361111
##   [6,] 0.0004166667
```

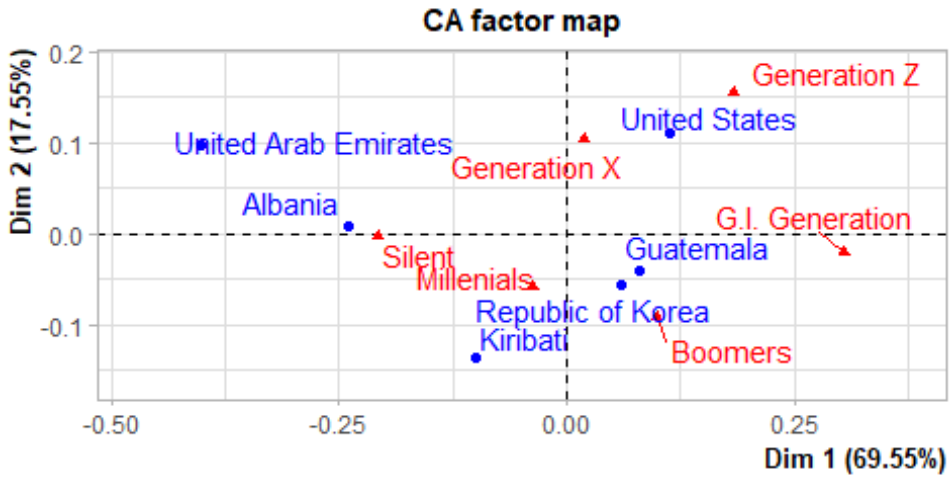
```
#Matriks C
Dc <- diag(column_sum_generation_country)
# Column profile:
(C <- mat_korespondensi_generation_country%*%solve(Dc))
```

```
##
##                              [,1]        [,2]        [,3]        [,4]
##   Albania              0.001119821 0.002674369 0.001608187 0.001973684
##   Guatemala            0.002222928 0.001698823 0.002238806 0.001990050
##   Kiribati             0.001994681 0.002286585 0.002083333 0.001822917
##   Republic of Korea    0.002239642 0.001925546 0.002241715 0.001681287
##   United Arab Emirates 0.000000000 0.003048780 0.001388889 0.002083333
##   United States        0.002482270 0.001693767 0.001851852 0.002361111
##
##                              [,5]        [,6]
##   Albania              0.002105263 0.001315789
##   Guatemala            0.002089552 0.001865672
##   Kiribati             0.002187500 0.000000000
##   Republic of Korea    0.002017544 0.002631579
##   United Arab Emirates 0.002083333 0.002083333
##   United States        0.001750000 0.002500000
```

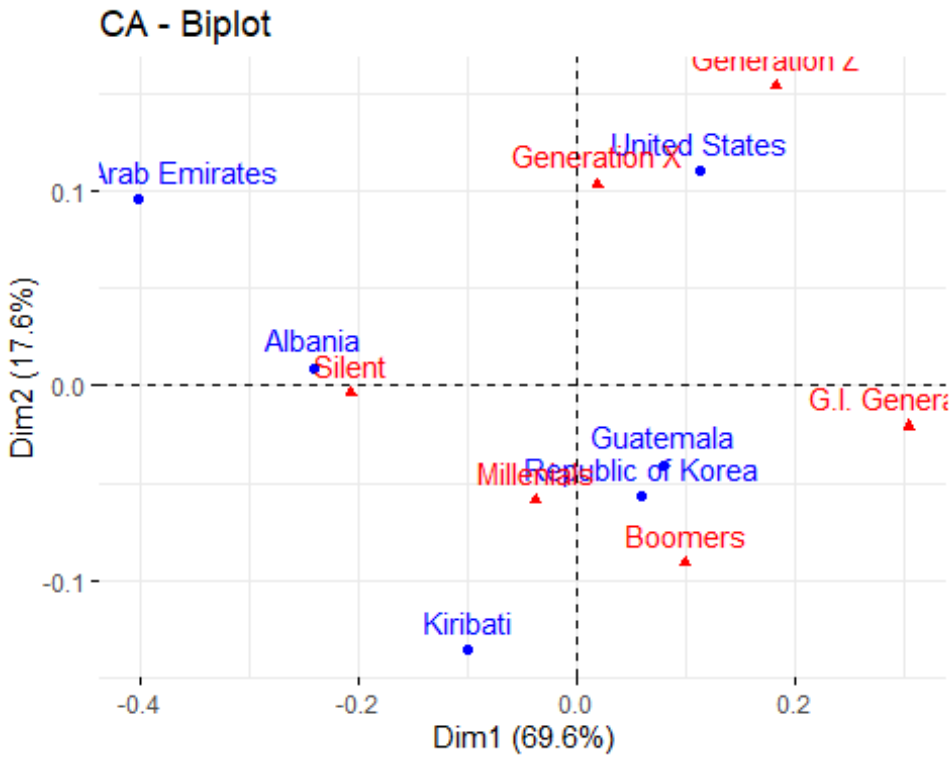
```r
## Testing Independence
# Melakukan uji chi-square untuk tabel kontingensi 'sex' dan 'age'
chisq.test(table_generation_country)
```

```
## Warning in chisq.test(table_generation_country): Chi-squared approximation
may
## be incorrect

##
##  Pearson's Chi-squared test
##
## data:  table_generation_country
## X-squared = 16.357, df = 25, p-value = 0.9038
```

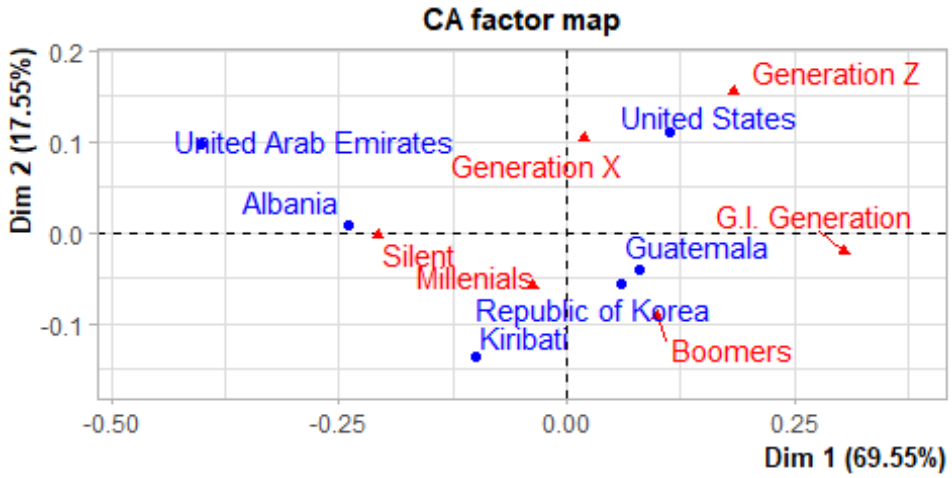
```r
## Coordinates for Plotting Row and Column Profiles
#Manual

#Langsung
res.ca <- CA(table_generation_country)
```




```r
fviz_ca_biplot(res.ca, repel = FALSE)
```



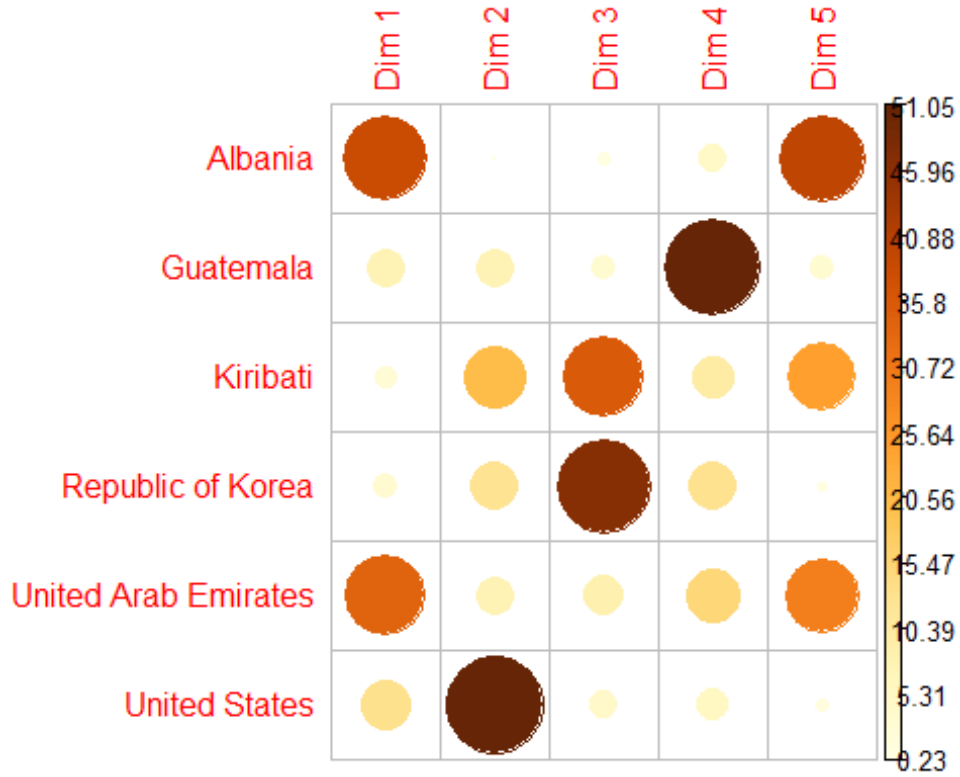

```r
ca <- CA(table_generation_country, graph = TRUE)
```



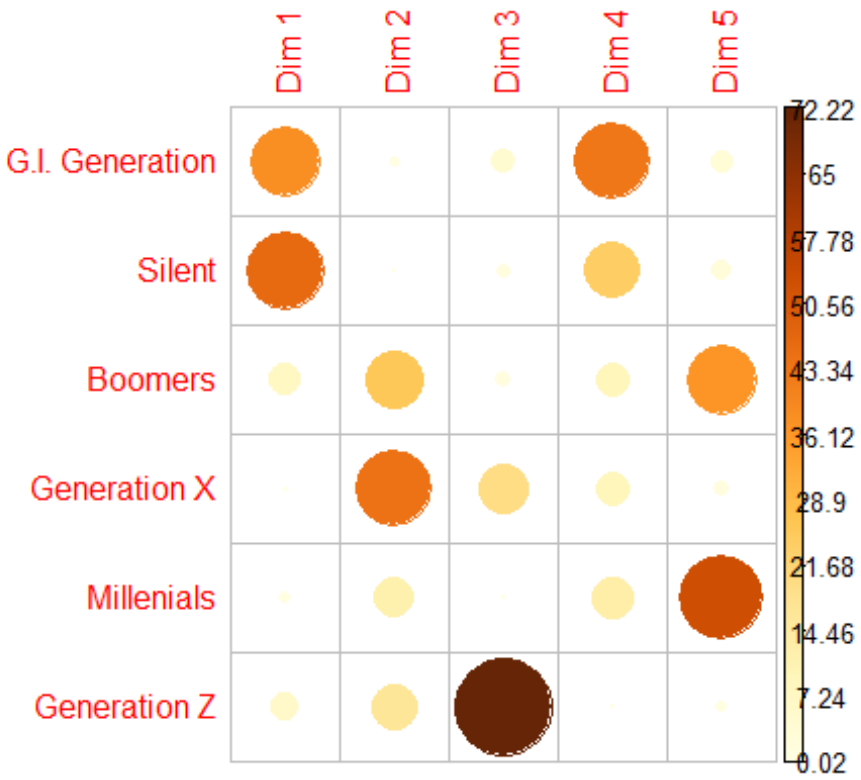
```r
#Matriks Y (column profiles)
ca$col$coord[, 1:2]
```

```
##                       Dim 1       Dim 2
## G.I. Generation  0.30446221 -0.02086802
## Silent          -0.20707327 -0.00369410
## Boomers          0.09951783 -0.09079666
## Generation X     0.01877096  0.10349967
## Millenials      -0.03719471 -0.05893778
## Generation Z     0.18353191  0.15403443
```

```r
#kontribusi
#Baris
corrplot(ca$row$contrib, is.corr = FALSE)
```




```r
#Kolom
corrplot(ca$col$contrib, is.corr = FALSE)
```


Dim 1
Dim 2
Dim 3
Dim 4
Dim 5
G.I. Generation
Silent
Boomers
Generation X
Millenials
Generation Z
72.22
65
57.78
50.56
43.34
36.12
28.9
21.68
14.46
7.24
0.02