FAMD RESULTS Group 4

Applying Factor Analysis for Mixed Data

```
data <- read.csv("C:\\Users\\Lakmini\\Desktop\\SEM 1 Level 4 2025\\ST 4052
Statistical Learning\\Analysis 1\\dermatology_database_1.csv")
#View(dermatology_database_1)
```

Load libraries

```
library(FactoMineR)
library(factoextra)

Loading required package: ggplot2

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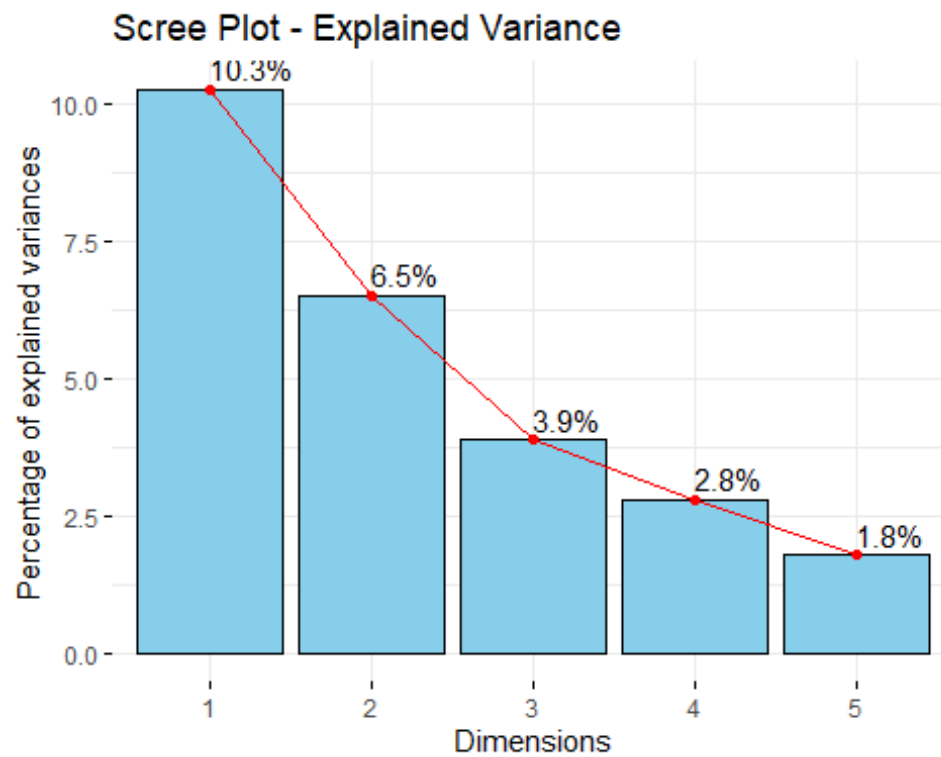
Run FAMD on data

```
famd_result <- FAMD(data, graph = FALSE)
```

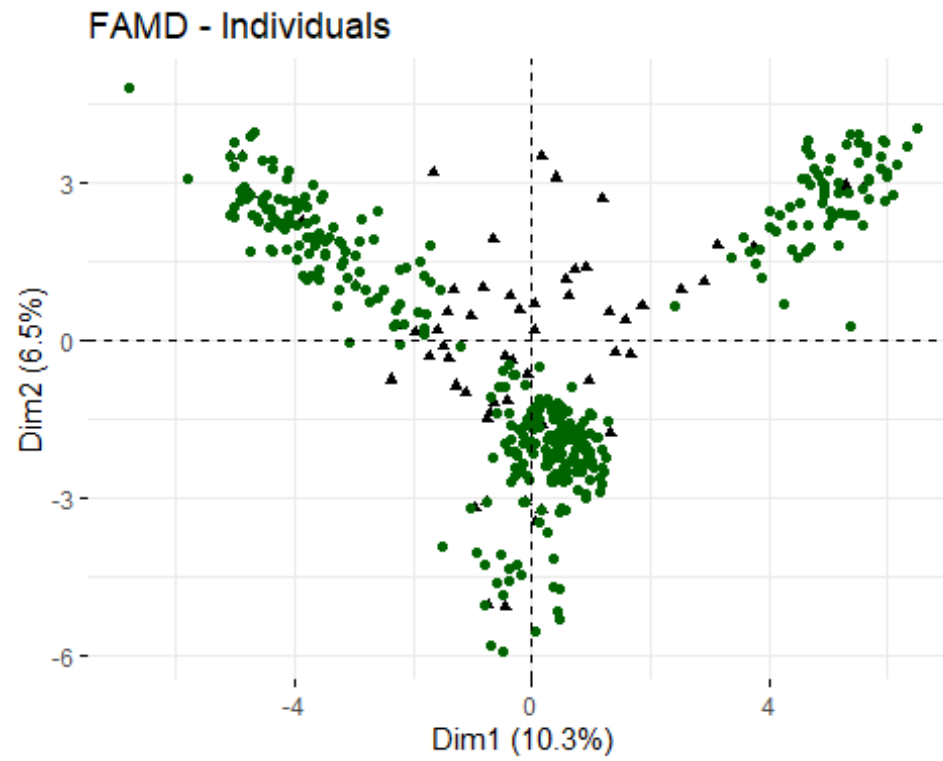1. Scree plot:

```
fviz_screeplot(famd_result,
               addlabels = TRUE,
               barfill = "skyblue",
               barcolor = "black",
               linecolor = "red") +
  ggtitle("Scree Plot - Explained Variance")
```
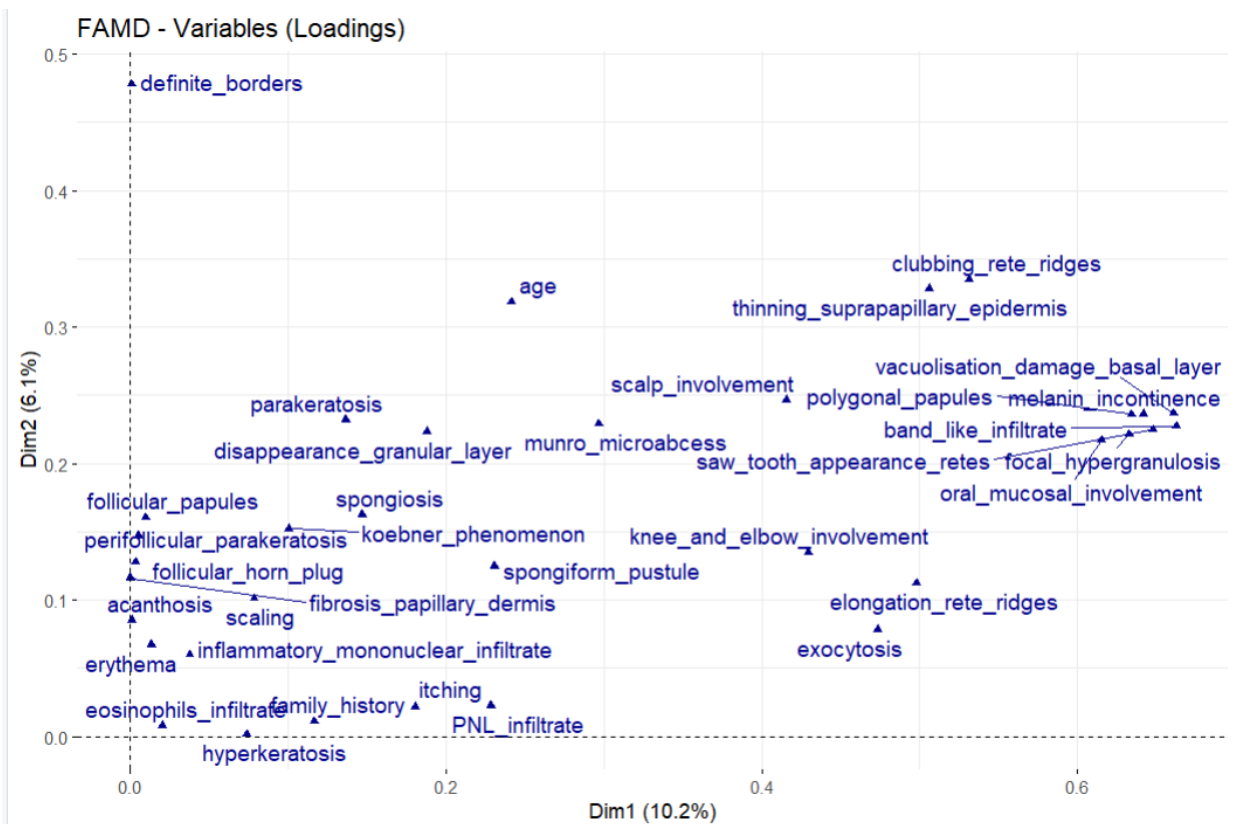
Scree Plot - Explained Variance

Score plot

```
fviz_famd_ind(famd_result,
              repel = TRUE,
              label = FALSE,
              geom = "point",
              col.ind = "darkgreen") +
  ggtitle("FAMD - Individuals")
```

FAMD - Individuals

Loading Plot

```r
fviz_famd_var(famd_result,
              repel = TRUE,
              col.var = "darkblue") +
  ggtitle("FAMD - Variables (Loadings)")
```

FAMD - Variables (Loadings)


```r
library(dplyr)


Attaching package: 'dplyr'

The following objects are masked from 'package:stats':

    filter, lag

The following objects are masked from 'package:base':

    intersect, setdiff, setequal, union

famd_result <- FAMD(data, graph = FALSE)
var_contrib <- get_famd_var(famd_result)$contrib

# Set number of top contributors to color
top_n <- 5

# Identify top variables for Dimension 1 and 2
top_dim1 <- rownames(var_contrib)[order(var_contrib[, 1], decreasing =
TRUE)][1:top_n]
top_dim2 <- rownames(var_contrib)[order(var_contrib[, 2], decreasing =
TRUE)][1:top_n]
```

```
# Create a color vector for all variables (default: grey)
var_colors <- rep("grey70", nrow(var_contrib))
names(var_colors) <- rownames(var_contrib)

# Assign red to top contributors for Dim 1
var_colors[top_dim1] <- "red"

# Assign blue to top contributors for Dim 2
var_colors[top_dim2] <- "blue"

# Visualize variable loadings with custom colors
fviz_famd_var(famd_result,
              repel = TRUE,
              col.var = var_colors) +
  ggtitle("FAMD - Top Contributors Colored by Dimension")
```
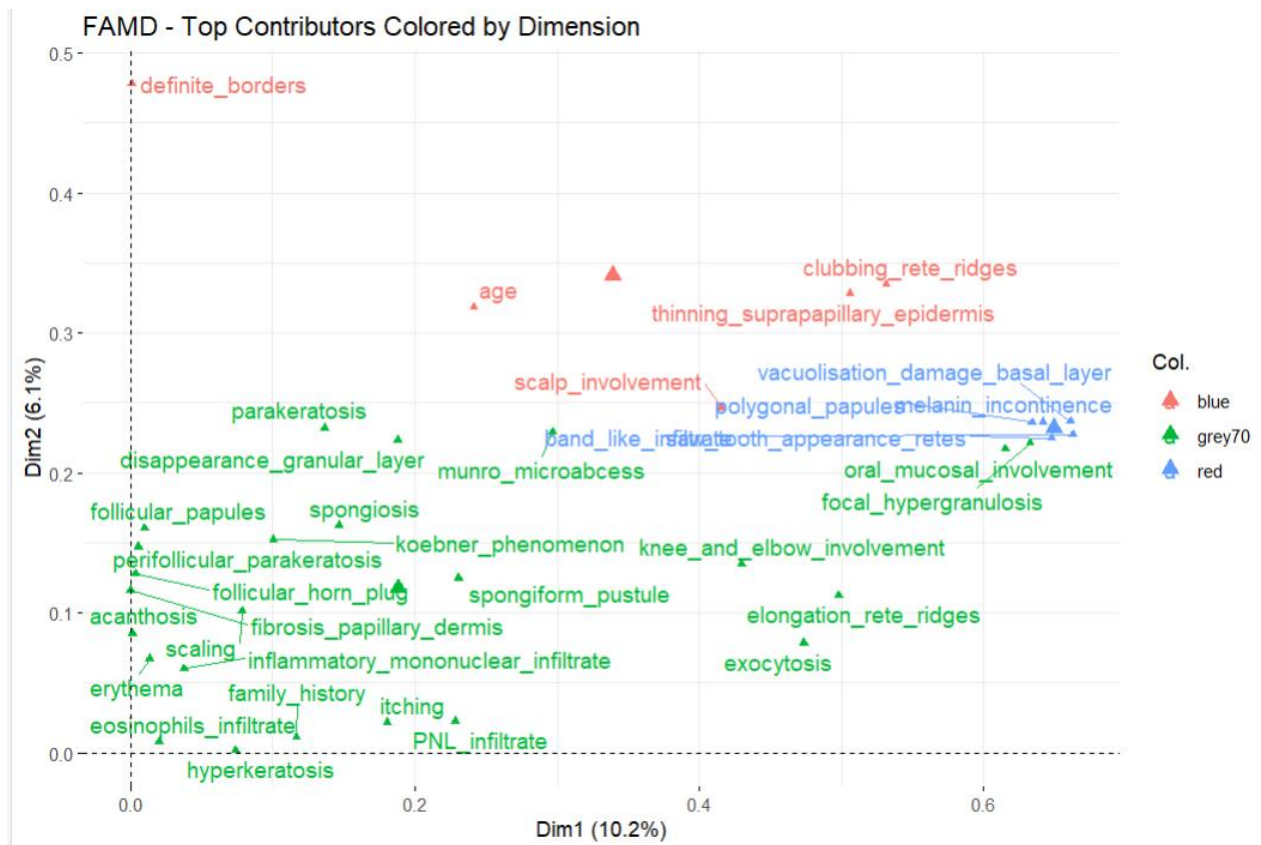

Variable contribution to Dim 1

```
fviz_contrib(famd_result,
             choice = "var",
             axes = 1,
             top = 15,
             fill = "steelblue",
             color = "steelblue") +
  ggtitle("Contribution of Variables to Dimension 1")
```

Contribution of Variables to Dimension 1