STATISTICAL GENOMICS AND BIOINFORMATICS PLATFORM

SAMPLE DATA ANALYSIS REPORT

Yong Won Jin

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PROJECT TITLE:  
Sample docx report  
SYNOPSIS:   
PREPARED FOR: R for Researchers  
REPORT PREPARED BY: Yong Won Jin  
 Statistical Genomics and Bioinformatics Platform  
 Max Rady College of Medicine  
 University of Manitoba  
 E-mail: yong.jin@umanitoba.ca  
 Tel: 204-789-3364  
TIME SPENT ON ANALYSIS:

# Table of content

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# Project description

## Study summary

This is where I would write a *summary* about the study/project - i.e. how it came about, who is involved, research question, what types of data were delivered, etc.

## Objectives

* List research objectives here
* You can use asterisk or dash to make a list

# Data preparation

## Load data

For the demo, we’ll just use the mtcars dataset.

head(mtcars)

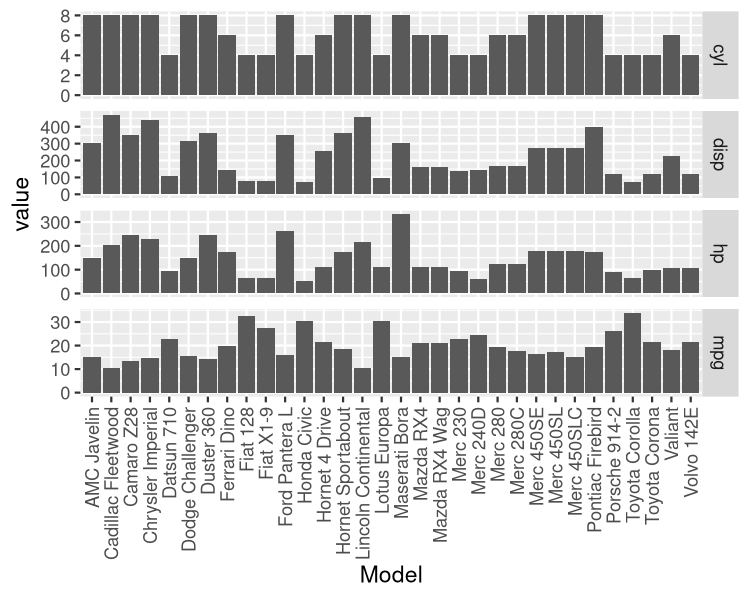
**Table** : First 6 rows of the mtcars dataset

| mpg | cyl | disp | hp | drat | wt | qsec | vs | am | gear | carb |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21.0 | 6 | 160 | 110 | 3.90 | 2.620 | 16.46 | 0 | 1 | 4 | 4 |
| 21.0 | 6 | 160 | 110 | 3.90 | 2.875 | 17.02 | 0 | 1 | 4 | 4 |
| 22.8 | 4 | 108 | 93 | 3.85 | 2.320 | 18.61 | 1 | 1 | 4 | 1 |
| 21.4 | 6 | 258 | 110 | 3.08 | 3.215 | 19.44 | 1 | 0 | 3 | 1 |
| 18.7 | 8 | 360 | 175 | 3.15 | 3.440 | 17.02 | 0 | 0 | 3 | 2 |
| 18.1 | 6 | 225 | 105 | 2.76 | 3.460 | 20.22 | 1 | 0 | 3 | 1 |

# Plots and Figures

Output from plotting functions are included.

mtcars %>%  
 select(mpg, cyl, disp, hp) %>%  
 rownames\_to\_column(var='Model') %>%  
 pivot\_longer(cols=-Model) %>%  
 ggplot(mapping=aes(x=Model,value)) +  
 geom\_bar(stat='identity') +  
 facet\_grid(name ~ ., scales='free') +   
 theme(axis.text.x = element\_text(angle = 90, vjust = 0.5, hjust=1))



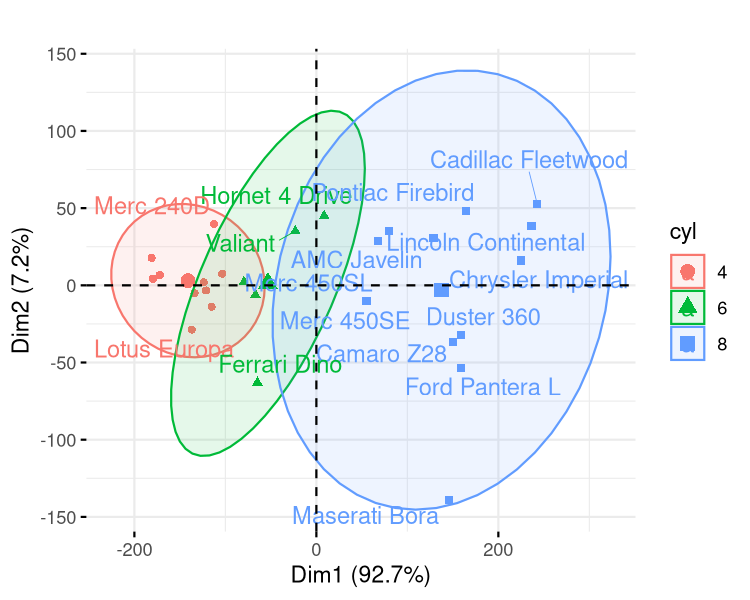
**Figure** : Bar plots of mpg, cyl, disp, and hp

## Plots

For .html output, you can include 3D interactive plots using plotly package.

### Principal Component Analysis

res.pca <- prcomp(mtcars)  
fviz\_pca\_ind(res.pca,  
 col.ind=as.factor(mtcars$cyl),  
 addEllipses = TRUE,  
 legend.title='cyl',  
 repel=TRUE,  
 title='')



**Figure** : PCA plot of car models from mtcars dataset

# Appendix

## Code

knitr::opts\_chunk$set(  
 echo = TRUE,  
 include = TRUE,  
 cache = FALSE,  
 dpi = 150,  
 cache.lazy = FALSE  
 )  
# Markdown  
library(officedown)  
library(officer)  
# Data wrangling  
library(tidyverse)  
# Plotting  
library(cowplot)  
library(plotly)  
library(factoextra)  
source('/home/jin/OneDrive/SGB/projects/functions.R')  
coverpage\_par <- fp\_par(  
 text.align = "left",   
 padding = 0,  
 padding.left = 0.63,  
 padding.right = 0.63,  
)  
head(mtcars)  
mtcars %>%  
 select(mpg, cyl, disp, hp) %>%  
 rownames\_to\_column(var='Model') %>%  
 pivot\_longer(cols=-Model) %>%  
 ggplot(mapping=aes(x=Model,value)) +  
 geom\_bar(stat='identity') +  
 facet\_grid(name ~ ., scales='free') +   
 theme(axis.text.x = element\_text(angle = 90, vjust = 0.5, hjust=1))  
res.pca <- prcomp(mtcars)  
fviz\_pca\_ind(res.pca,  
 col.ind=as.factor(mtcars$cyl),  
 addEllipses = TRUE,  
 legend.title='cyl',  
 repel=TRUE,  
 title='')  
sessionInfo()

## R session info

sessionInfo()

## R version 4.1.3 (2022-03-10)  
## Platform: x86\_64-redhat-linux-gnu (64-bit)  
## Running under: CentOS Stream 9  
##   
## Matrix products: default  
## BLAS/LAPACK: /usr/lib64/libopenblas-r0.3.15.so  
##   
## locale:  
## [1] LC\_CTYPE=en\_CA.UTF-8 LC\_NUMERIC=C   
## [3] LC\_TIME=en\_CA.UTF-8 LC\_COLLATE=en\_CA.UTF-8   
## [5] LC\_MONETARY=en\_CA.UTF-8 LC\_MESSAGES=en\_CA.UTF-8   
## [7] LC\_PAPER=en\_CA.UTF-8 LC\_NAME=C   
## [9] LC\_ADDRESS=C LC\_TELEPHONE=C   
## [11] LC\_MEASUREMENT=en\_CA.UTF-8 LC\_IDENTIFICATION=C   
##   
## attached base packages:  
## [1] stats graphics grDevices utils datasets methods base   
##   
## other attached packages:  
## [1] factoextra\_1.0.7 plotly\_4.10.0 cowplot\_1.1.1 forcats\_0.5.1   
## [5] stringr\_1.4.0 dplyr\_1.0.9 purrr\_0.3.4 readr\_2.1.2   
## [9] tidyr\_1.2.0 tibble\_3.1.8 ggplot2\_3.3.6 tidyverse\_1.3.2   
## [13] officer\_0.4.3 officedown\_0.2.4  
##   
## loaded via a namespace (and not attached):  
## [1] httr\_1.4.3 jsonlite\_1.8.0 viridisLite\_0.4.0   
## [4] carData\_3.0-5 modelr\_0.1.8 assertthat\_0.2.1   
## [7] googlesheets4\_1.0.0 cellranger\_1.1.0 yaml\_2.3.5   
## [10] ggrepel\_0.9.1 gdtools\_0.2.4 pillar\_1.8.0   
## [13] backports\_1.4.1 glue\_1.6.2 uuid\_1.1-0   
## [16] digest\_0.6.29 ggsignif\_0.6.3 rvest\_1.0.2   
## [19] colorspace\_2.0-3 htmltools\_0.5.3 pkgconfig\_2.0.3   
## [22] broom\_1.0.0 haven\_2.5.0 scales\_1.2.0   
## [25] tzdb\_0.3.0 googledrive\_2.0.0 car\_3.1-0   
## [28] farver\_2.1.1 generics\_0.1.3 ggpubr\_0.4.0   
## [31] ellipsis\_0.3.2 cachem\_1.0.6 withr\_2.5.0   
## [34] lazyeval\_0.2.2 cli\_3.3.0 magrittr\_2.0.3   
## [37] crayon\_1.5.1 readxl\_1.4.0 memoise\_2.0.1   
## [40] evaluate\_0.15 fs\_1.5.2 fansi\_1.0.3   
## [43] rstatix\_0.7.0 xml2\_1.3.3 tools\_4.1.3   
## [46] data.table\_1.14.2 hms\_1.1.1 gargle\_1.2.0   
## [49] lifecycle\_1.0.1 munsell\_0.5.0 reprex\_2.0.1   
## [52] zip\_2.2.0 compiler\_4.1.3 systemfonts\_1.0.4   
## [55] rlang\_1.0.4 grid\_4.1.3 rstudioapi\_0.13   
## [58] htmlwidgets\_1.5.4 labeling\_0.4.2 rmarkdown\_2.14   
## [61] gtable\_0.3.0 abind\_1.4-5 DBI\_1.1.3   
## [64] R6\_2.5.1 rvg\_0.2.5 lubridate\_1.8.0   
## [67] knitr\_1.39 fastmap\_1.1.0 utf8\_1.2.2   
## [70] stringi\_1.7.8 Rcpp\_1.0.9 vctrs\_0.4.1   
## [73] dbplyr\_2.2.1 tidyselect\_1.1.2 xfun\_0.31