# Biostatistics: Theory and Applications in R (Virtual)

## Week8_Session2_R_training8

## Contents





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```
#Set the working directory- getwd()/ setwd("Y:/")
getwd()
setwd("C:/Users/Fahmida Sultana/Desktop/R training/R_training_Class_08")


#install openxlsx package or xlsx package
library(openxlsx)
library(readxl)


#####import data set from xlsx file
study_1 <- read.xlsx("Tree_height.xlsx")
str(study_1)

study_2 <- read_excel("Tree_height.xlsx", sheet = "study_2")
str(study_2)
```

## #Add plot together

```
#The usage of patchwork is simple: just add plots together!

library(ggplot2)
library(patchwork)


str(study_1)

p1<- ggplot(study_1, aes(x=treatment, y=biomass, fill=treatment)) +
  geom_bar(position="dodge", stat="identity")


p2<-ggplot(study_1, aes(x = plant, y = biomass)) +
  stat_boxplot(geom = "errorbar", # Error bars
               width = 0.2) +    # Bars width
  geom_boxplot()

p3<-ggplot(study_1, aes(x = treatment, y = biomass, fill= treatment)) +
  stat_boxplot(geom = "errorbar", # Error bars
               width = 0.2) +    # Bars width
  geom_violin()


p4<- ggplot(study_1, aes(x=year, y=biomass)) +
  geom_point() +
  geom_smooth(method=lm , color="red",lwd=1, se=FALSE) +
```

```
 theme_gray()
```

## #simple addition

```
p1 + p2
```

## #nested patchwork

```
patch <- p1 + p2

p3 + patch

patch - p3

#or

wrap_plots(patch, p3)

wrap_plots(p3, patch)
```

## #Adding text: position right side

```
p1 + grid::textGrob('Some really important text')


#Adding text: position left side

# This won't do anything
grid::textGrob('Text on left side') + p1
#> NULL


# This will work
wrap_elements(grid::textGrob('Text on left side')) + p1
```

## #Stacking and packing

```
#putting plots besides each other or on top of each other
#patchwork provides 2 shortcut operators.
```

# "|" will place plots next to each other
# "/" will place them on top of each other.

## #plots next to each other

```
p1 + p2
#or
p1 | p2
```

## #on top of each other

```
p1 / p2
```

## #complex addition: nested plot and normal plot

```
p1 / (p2 | p3)
```

```
(p1 | p2 ) / p3
```

## #Modifying the theme of patchwork

```
patchwork <- p1 / (p2 | p3)
patchwork
```

```
patchwork & theme_minimal()
```

## #Controlling Layouts

## #Adding an empty area

```
p1 + plot_spacer() + p2 + plot_spacer() + p3 + plot_spacer()
```

## #Controlling the grid

```
p1 + p2 + p3 + p4 +
  plot_layout(ncol = 3)


p1 + p2 + p3 + p4 +
  plot_layout(widths = c(1, 1)) # all figure same size


p1 + p2 + p3 + p4 +
  plot_layout(widths = c(2, 1)) # 1st column double size and 2nd column single size
```

## #Insets

```
p4 + inset_element(p2, left = 0.6, bottom = 0.6, right = 1, top = 1)
```

# #Loading Files from Other Programs

```
#File format              - Function              - Library
#ERSI ArcGIS             -read.shapefile    -shapefiles
#Matlab                       -readMat           -R.matlab
#minitab                     -read.mtp           -foreign
#SAS (permanent data set)       -read.ssd              -foreign
#SAS (XPORT format)      -read.xport         -foreign
#SPSS                    -read.spss        -foreign
#Stata                   -read.dta           -foreign
#Systat                  -read.systat    -foreign
```

# #How to get data from website

```
#Importing Data from Web
#library(dplyr)
#URL(https://raw.githubusercontent.com/ds4stats/r-tutorials/master/intro-
maps/data/StatePopulation.csv)

#go to File - Import dataset - from text (readr)...- use the URL

#or

web_data <- read.csv("https://raw.githubusercontent.com/ds4stats/r-tutorials/master/intro-
maps/data/StatePopulation.csv", as.is = TRUE)
str(web_data)
```

## #Export a DataFrame to Excel File in R

```
#install.packages("writexl")

library("writexl")

#the DataFrame

web_data <- read.csv("https://raw.githubusercontent.com/ds4stats/r-tutorials/master/intro-maps/data/StatePopulation.csv", as.is = TRUE)
print (web_data)

#The DataFrame name is: web_data
#get the path of wd

getwd()

#"C:/Users/Fahmida Sultana/Desktop/R training/R_training_Class_08"
#"C:\\Users\\Fahmida Sultana\\Desktop\\R training\\R_training_Class_08"

write_xlsx(web_data, "C:\\Users\\Fahmida Sultana\\Desktop\\R training\\R_training_Class_08\\week8.xlsx")

#or
write_xlsx(web_data, "week8_1.xlsx")



#another example

library(openxlsx)
library(readxl)
study_1 <- read.xlsx("Tree_height.xlsx")
str(study_1)


#summary statistics
library(Rmisc)

#export the sum within a data set

sum1<-aggregate(biomass~treatment+year,data=study_1,FUN=sum)
print(sum1)


write_xlsx(sum1, "C:\\Users\\Fahmida Sultana\\Desktop\\R training\\R_training_Class_08\\sum2.xlsx")
```

```
#or
write_xlsx(sum1, "sum2_1.xlsx")


#Export the mean, sd, se, ci  within a data set

mean1 <- summarySE(study_1, measurevar="biomass", groupvars=c("treatment"), na.rm=FALSE)
print(mean1)

write_xlsx(mean1, "C:\\Users\\Fahmida Sultana\\Desktop\\R
training\\R_training_Class_08\\treatment.xlsx")

#or

write_xlsx(mean1, "treatment_1.xlsx")


#Export csv file
write.csv(mean1, "csvfile.csv", row.names = FALSE)


#Export data with xlsx package

library(xlsx)

mean1 <- summarySE(study_1, measurevar="biomass", groupvars=c("treatment"), na.rm=FALSE)
print(mean1)

write.xlsx(mean1, "excelfile.xlsx", rowNames = FALSE)
```

## #Import simple graph and make it better in PowerPoint

```
str(study_1)

p1<- ggplot(study_1, aes(x=treatment, y=biomass)) +
  geom_bar(position="dodge", stat="identity")

p1

p2<-ggplot(study_1, aes(x = plant, y = biomass)) +
  stat_boxplot(geom = "errorbar", # Error bars
               width = 0.2) +    # Bars width
  geom_boxplot()+
  theme_bw()
p2
```