# 1st-step: The Data ------

## Import and rename----

library(readxl) # read\_excel

my\_data <- read\_excel(file.choose())

## Checking------

head(my\_data)

tail(my\_data)

View(my\_data)

table(my\_data$factor1,my\_data$factor2) # Balanced

## The structure------

str(my\_data) # before modification

my\_data$factor1 <- as.factor(my\_data$factor1)

my\_data$factor2 <- as.factor(my\_data$factor2)

my\_data$block <- as.character(my\_data$Rep)

my\_data$DependentVar <- as.numeric(my\_data$DV)

str(my\_data) # after modification

# 2nd-step: The ANOVA test ----

# APPROACH I: Using Base R------

## Using aov() & anova() -----

### 1st -build a model-----

mod1<-aov(DependentVar~factor1+factor2+block+ factor1:factor2,

data=my\_data)

### 2nd-ANOVA table-----

anova(mod1)

## Using lm() & anova() -----

### 1st -build a model-----

mod2<-lm(DependentVar~factor1+factor2+block+ factor1:factor2,

data=my\_data)

### 2nd-ANOVA table-----

anova(mod2)

#APPROACH II: Using car package ------

library(car) # type II and III

# With type II------

### 1st -build a model-----

mod3<-lm(DependentVar~factor1+factor2+block+ factor1:factor2,

data=my\_data,contrasts=list(factor1=contr.sum,

factor2=contr.sum))

### 2nd-ANOVA table-----

Anova(mod3)

# With type III------

## 1st -build a model-----

mod4<-lm(DependentVar~factor1+factor2+block+ factor1:factor2,

data=my\_data,contrasts=list(factor1=contr.sum,

factor2=contr.sum))

## 2nd-ANOVA table-----

Anova(mod4, type=3)