setwd("C:/Users/Pman/Desktop/REGRESSION MODELS")  
  
*# Read data from file and create a data.frame*  
skincells <- read.csv("skincells.csv")  
skincells

by(skincells$logcells, skincells$time, mean)

by(skincells$logcells, skincells$day, mean)

*# Create plot*  
library(ggplot2)

## Warning: package 'ggplot2' was built under R version 4.2.3

p <- ggplot(skincells, aes(x = time, y = logcells, color = time)) +   
 geom\_point(size = 3) +   
 scale\_color\_gradient(low = "blue", high = "orange") +  
 xlab("Time") +  
 ylab("Log cells") +  
 ggtitle("Skin cells over time")  
p

*# Save plot as .jpeg file*  
jpeg("C:/Users/Pman/Desktop/REGRESSION MODELS/logcells\_time.jpeg",   
 quality = 100, width = 800, height = 600)  
print(p)  
  
dev.off()

*# Create plot*  
q <- ggplot(skincells, aes(x = day, y = logcells)) +   
 geom\_point(size = 3, color = "blue") +  
 xlab("Day") +  
 ylab("Log cells") +  
 ggtitle("Skin cells over time") +  
 theme\_bw()  
  
*# Save plot as .jpeg file*  
jpeg("C:/Users/Pman/Desktop/REGRESSION MODELS/logcells\_day.jpeg",   
 quality = 100, width = 800, height = 600)  
print(q)  
  
dev.off()

*# Regression model 1: 'main effects' non interaction*  
fit1 <- lm(logcells~factor(time) + factor(day), data = skincells)  
summary(fit1)

drop1(fit1, test = 'F')

library(emmeans)  
emm\_options(shape = c(15, 16, 17, 18, 19, 20, 21, 22))  
emmip(fit1, factor(time) ~ factor(day))

emmeans(fit1,~factor(time)+ factor(day))

emmeans(fit1,pairwise~factor(time)+ factor(day), adjust = 'none')

*# Create the emmip plot and save it as a jpeg image*  
my\_plot <- emmip(fit1, factor(time) ~ factor(day))  
jpeg("C:/Users/Pman/Desktop/REGRESSION MODELS/fit1.jpg",   
 width = 297, height = 210, units = "mm", res = 600)  
print(my\_plot)

dev.off()

*# Regression model 2: Interaction (full factorial model)*  
fit2 <- lm(logcells~factor(time)\*factor(day), data = skincells)  
summary(fit2)

drop1(fit2, test = 'F')

emmip(fit2, factor(time)~factor(day))

emmeans(fit2,~factor(time)+ factor(day))

*# Create the emmip plot and save it as a jpeg image*  
my\_plot2 <- emmip(fit2, factor(time) ~ factor(day))  
jpeg("C:/Users/Pman/Desktop/REGRESSION MODELS/fit2.jpg",   
 width = 297, height = 210, units = "mm", res = 600)  
print(my\_plot2)

dev.off()