Practical 3

Visualisation using qplot()

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```
library(ggplot2)

# Load the dataset
queratocono <- read.csv("./datasets/queratocono.csv")

# Display the names of the columns
colnames(queratocono)
```

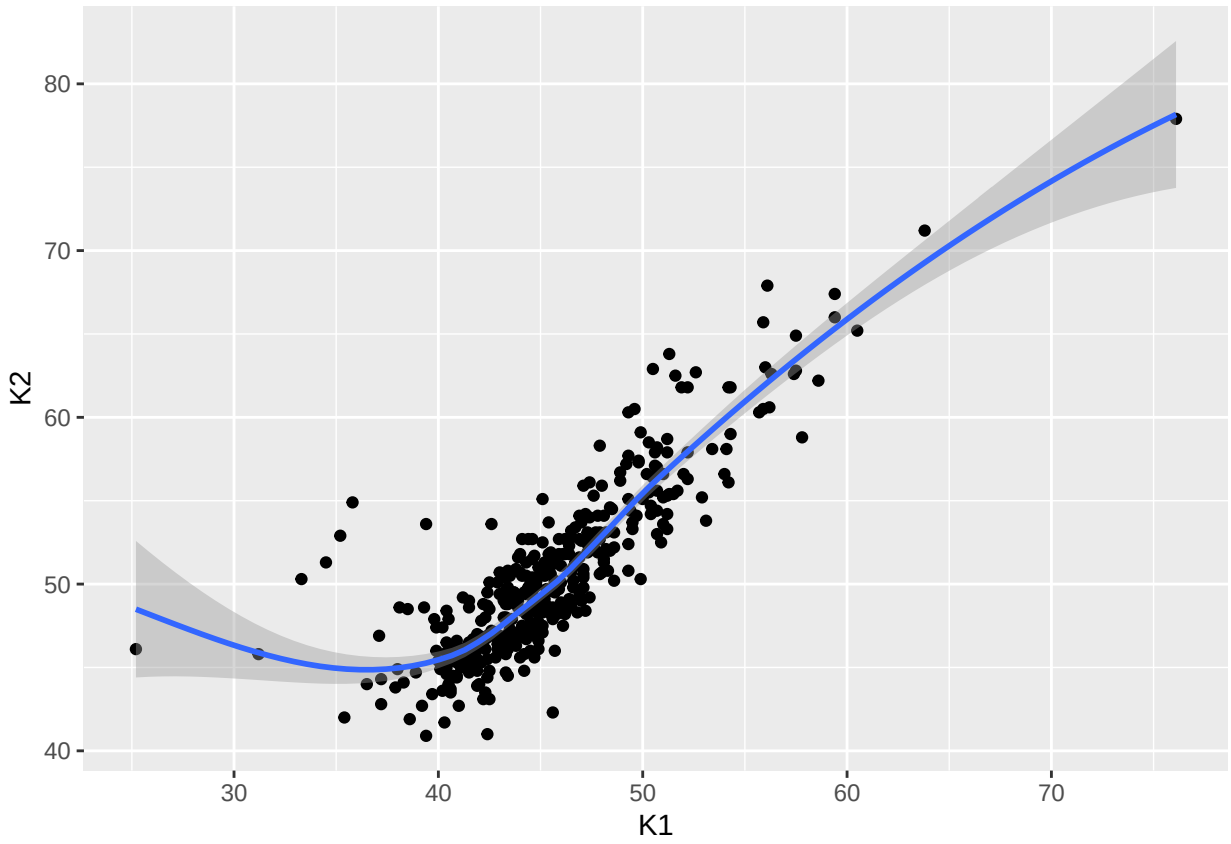
```
##  [1] "K1"        "K2"        "ch"        "na"        "Incision"  "Prof"
##  [7] "diam"      "grosor"    "Longitud1" "Longitud2" "grosor1"   "grosor2"
## [13] "long1"     "long2"     "K1.salida" "Astig"
```

EXERCICE 1

```
# Study the relation between K1 and K2 with smoother
# (by default and using linear regression).

# Default smoother
qplot(K1, K2, data = queratocono, geom = "point") +
  geom_smooth()
```

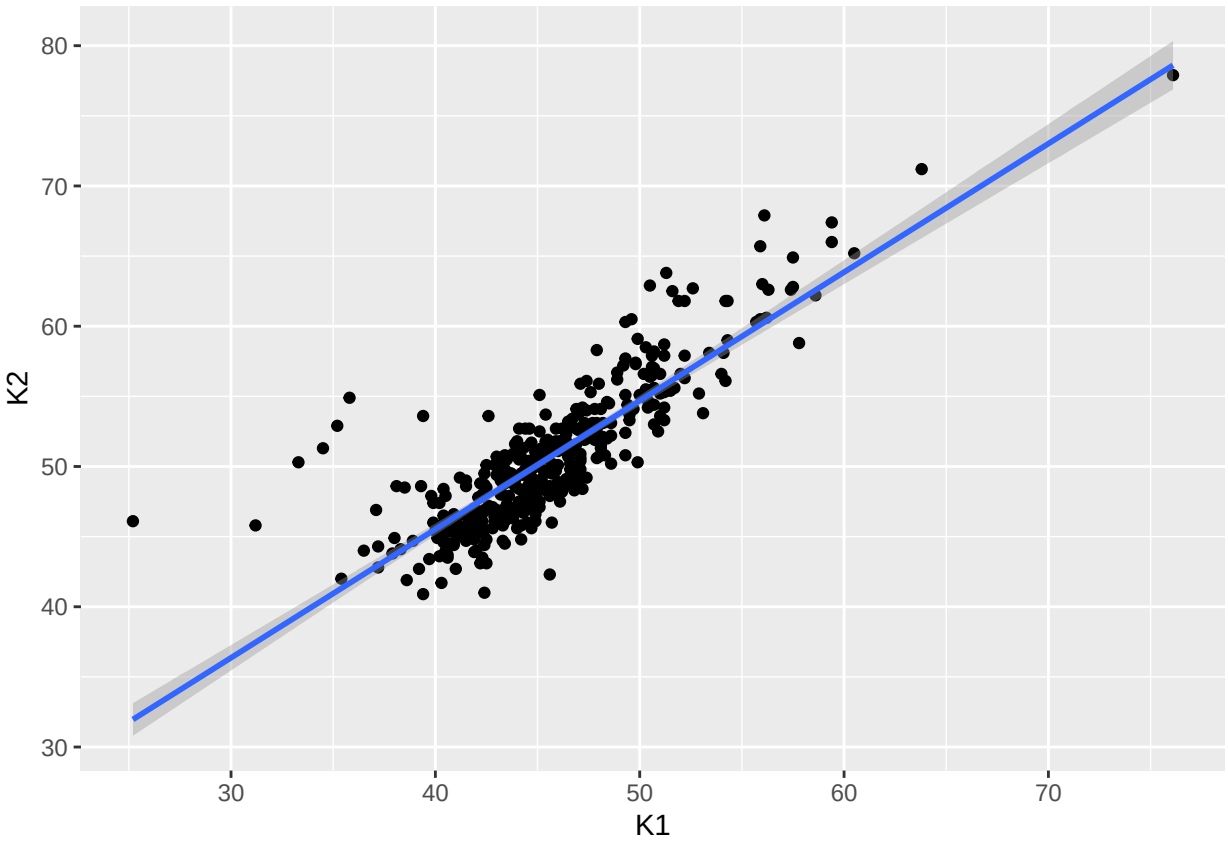
```
## Warning: `qplot()` was deprecated in ggplot2 3.4.0.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was generated.
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```




```
# Linear regression smoother
qplot(K1, K2, data = queratocono, geom = "point") +
  geom_smooth(method = "lm")
```

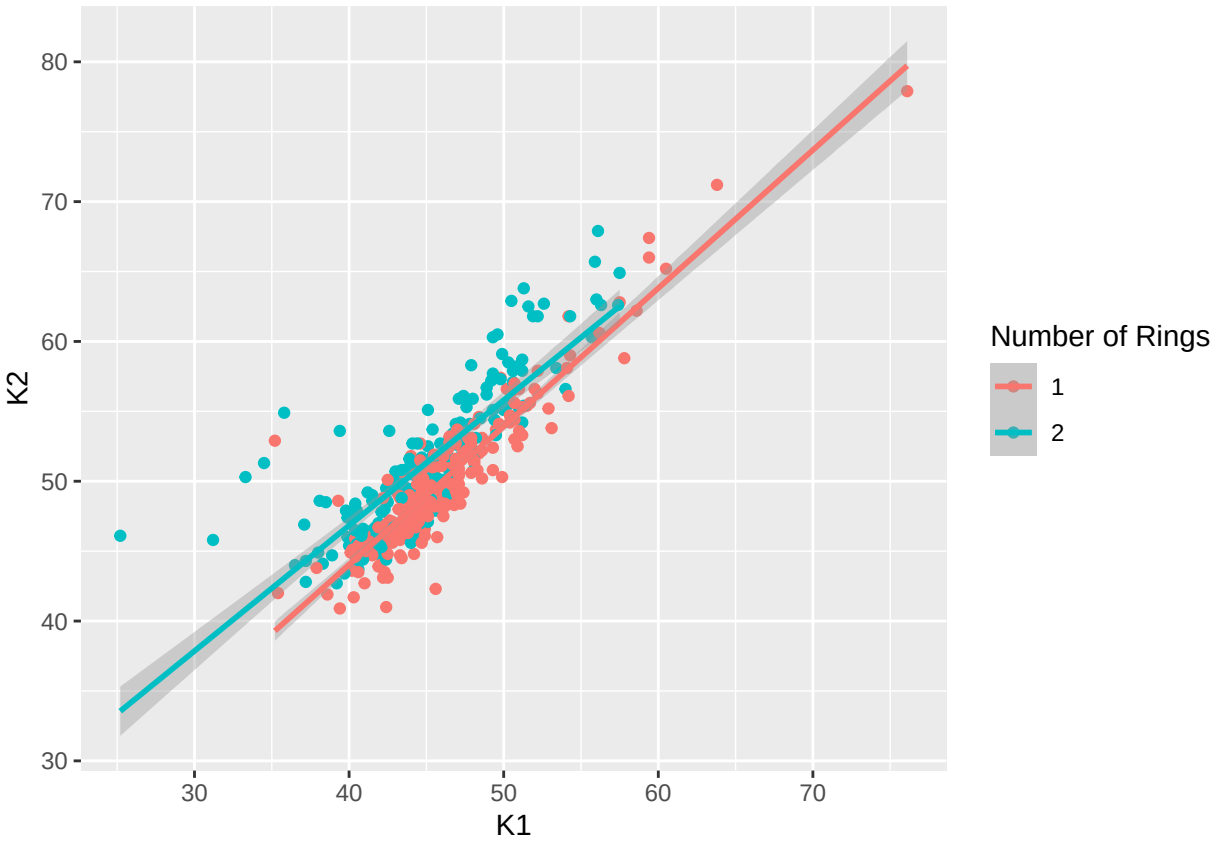
```
## `geom_smooth()` using formula = 'y ~ x'
```



EXERCICE 2

```
# Study the relation between K1 and K2
# distinguishing by factor na.

qplot(K1, K2, data = queratocono, color = factor(na), geom = "point") +
  geom_smooth(method = "lm") +
  labs(color = "Number of Rings")
```

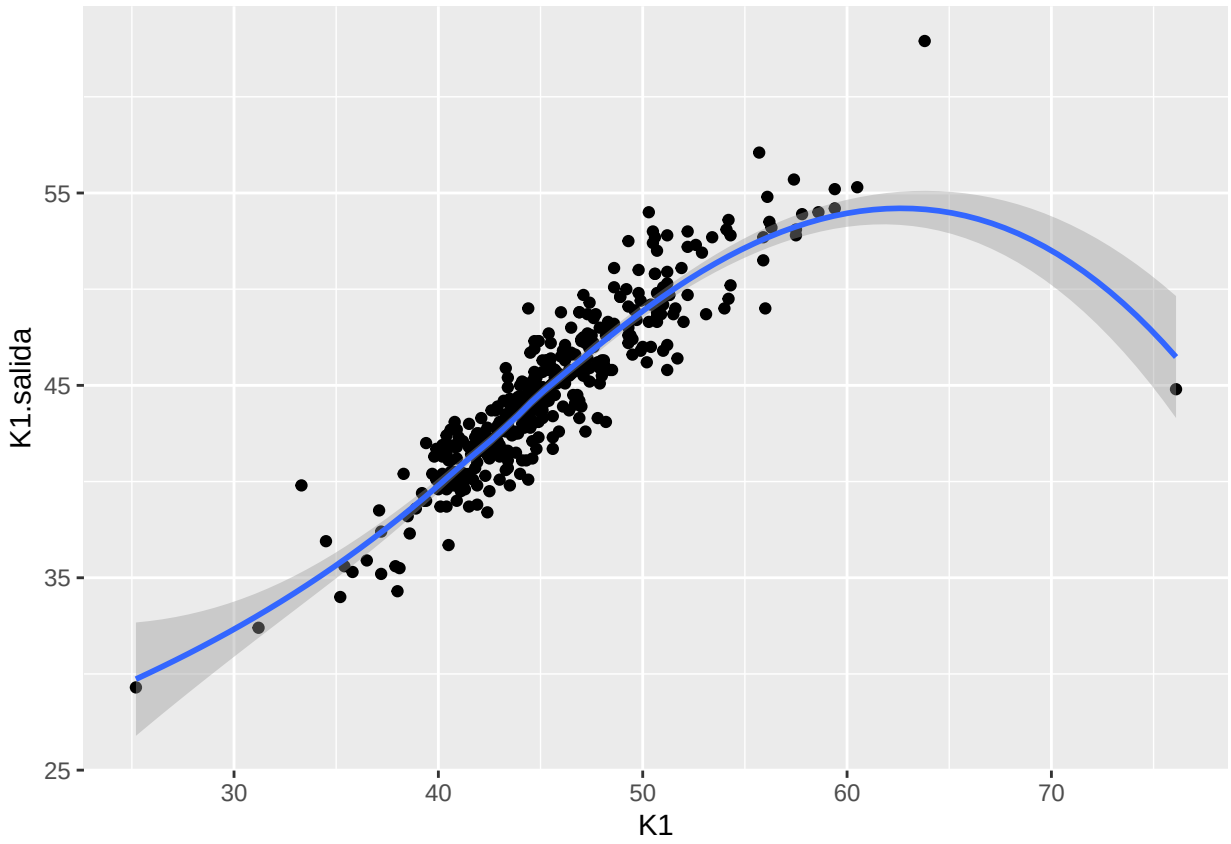
```
## `geom_smooth()` using formula = 'y ~ x'
```



EXERCICE 3

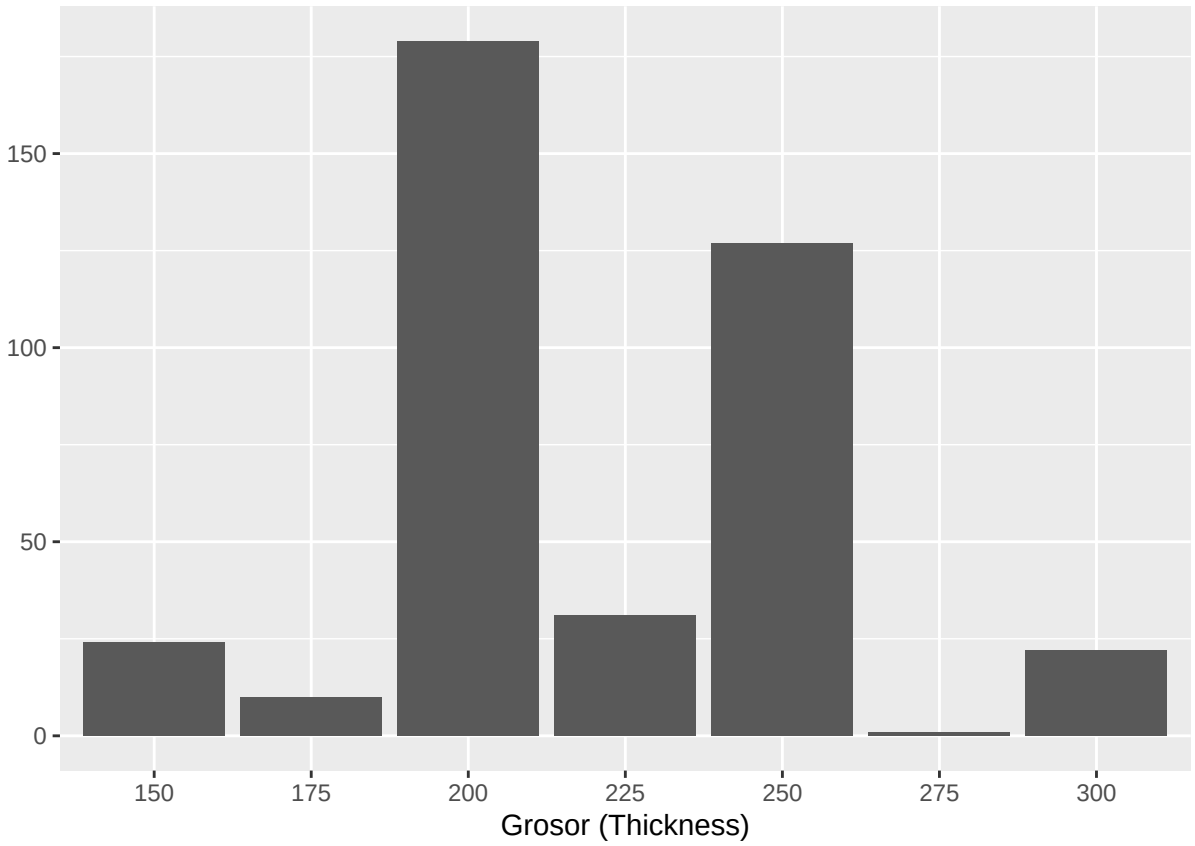
```
# Study the relation between K1 and K1.salida

qplot(K1, K1.salida, data = queratocono, geom = "point") +
  geom_smooth()
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



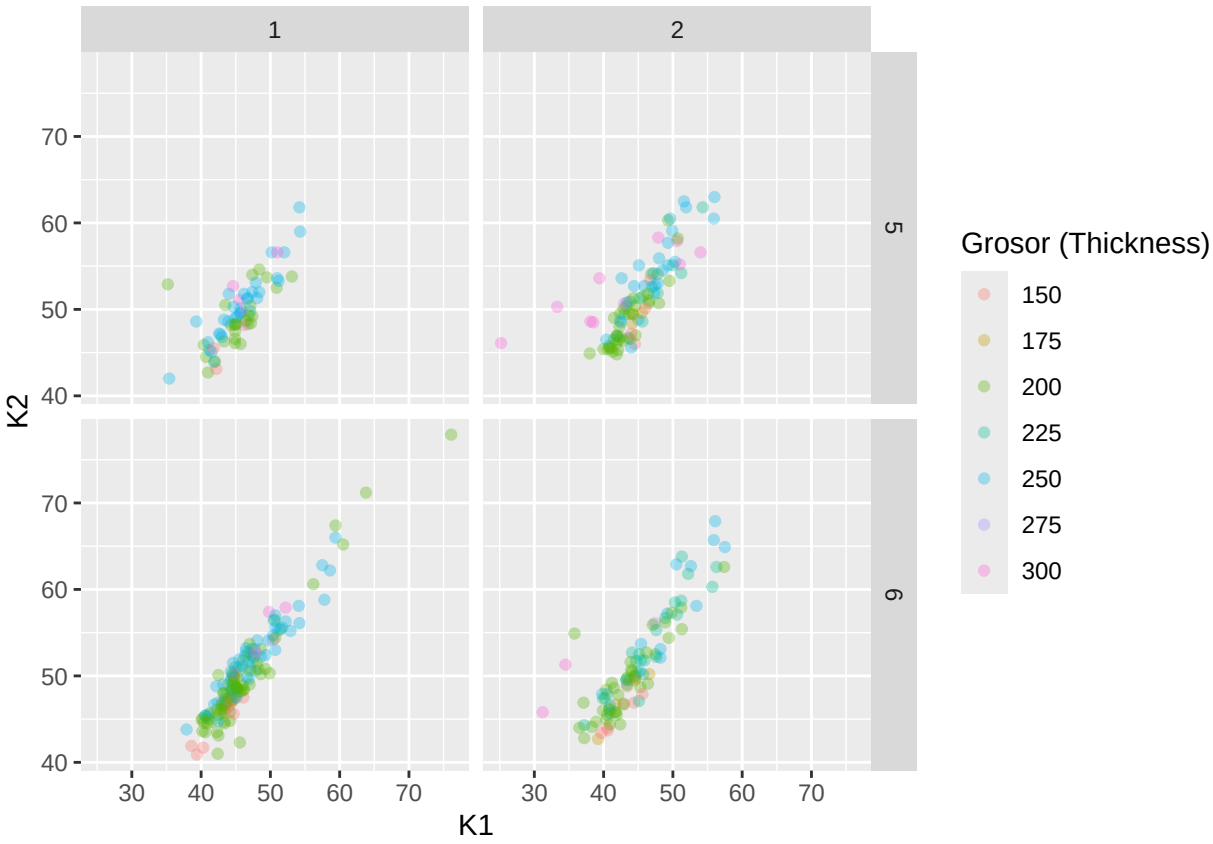
EXERCICE 4

```
# Build a histogram in terms of grosor
# (note that grosor should be taken as a factor) of the inserted ring

qplot(factor(grosor), data = queratocono, geom = "bar") +
  labs(x = "Grosor (Thickness)")
```



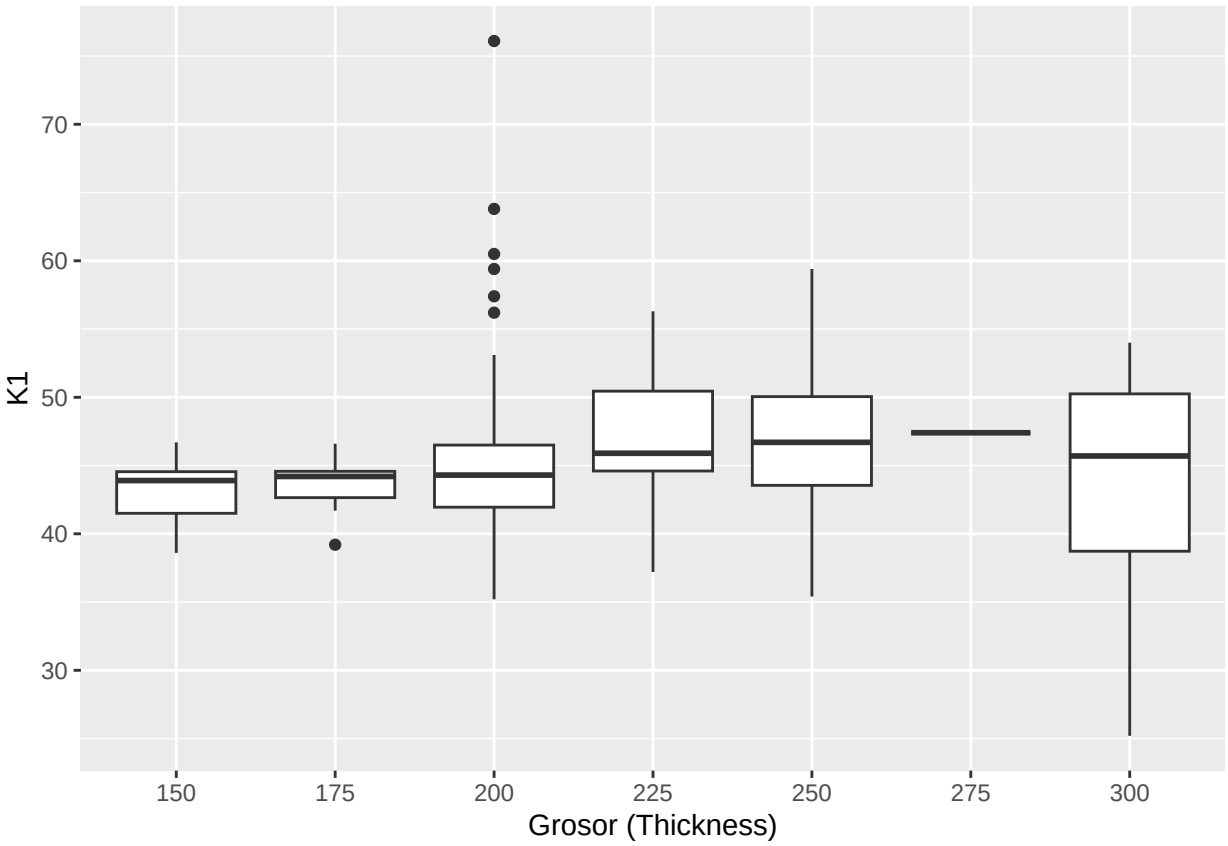
EXERCICE 5

```
# Build a scatter plot of the relation between K1 and K2 with "faceting" in
# terms of the parameters diam and na, by assigning different colours to the
# points according to the thickness (grosor) of the ring. In order to visualise
# all points correctly use a transparency of value 1/3

qplot(K1, K2, data = queratocono, color = factor(grosor), geom = "point", alpha = I(1 / 3)) +
  facet_grid(diam ~ na) +
  labs(color = "Grosor (Thickness)")
```

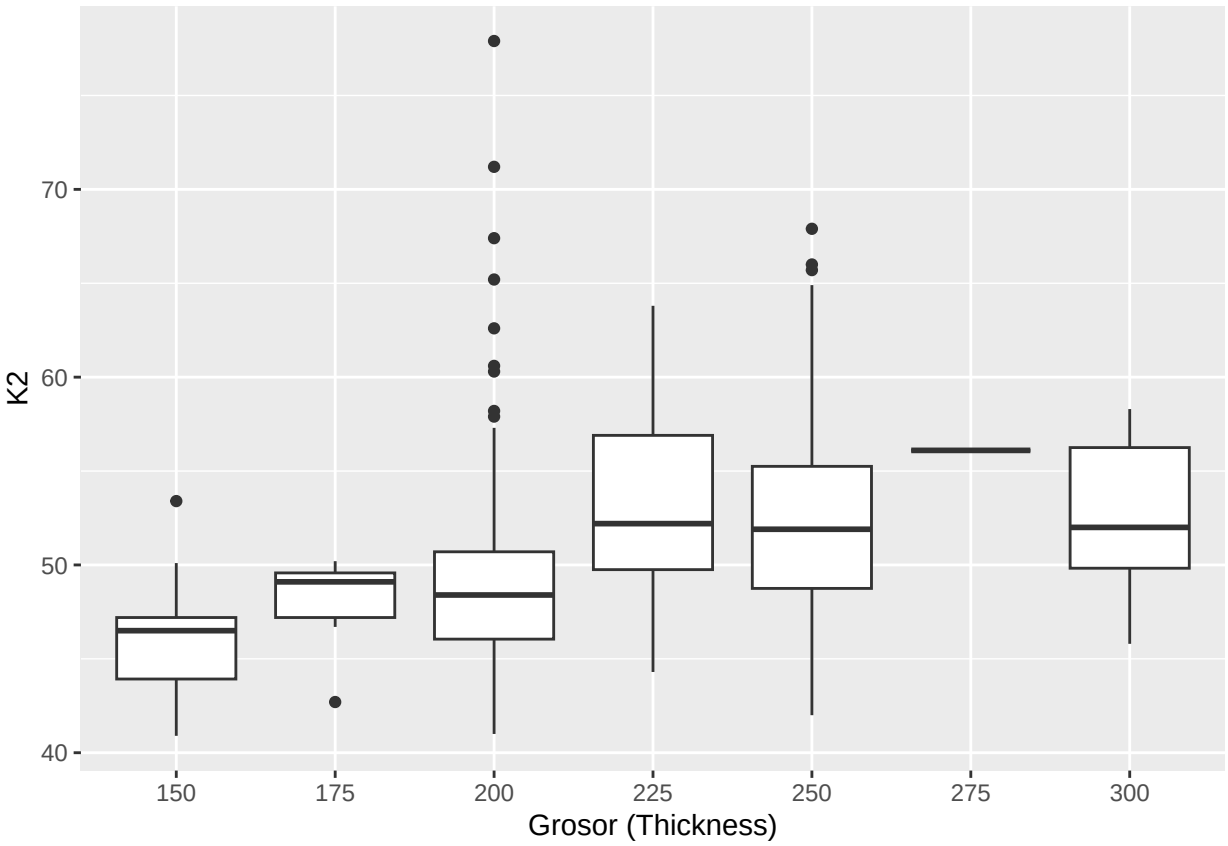


EXERCICE 6

```
# Create two boxplots that show a summary of the distributions of K1 and K2
# (separately) with respect to the thickness (grosor)

# Boxplot for K1
qplot(factor(grosor), K1, data = queratocono, geom = "boxplot") +
  labs(x = "Grosor (Thickness)", y = "K1")
```




```
# Boxplot for K2
qplot(factor(grosor), K2, data = queratocono, geom = "boxplot") +
  labs(x = "Grosor (Thickness)", y = "K2")
```


K2
70
60
50
40
150
175
200
225
250
275
300
Grosor (Thickness)