Analysis of CO2 Dataset

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```
# LOAD & VIEW THE DATA

data("CO2")
head (CO2)
```

```
##   Plant   Type  Treatment conc uptake
## 1   Qn1 Quebec nonchilled   95   16.0
## 2   Qn1 Quebec nonchilled  175   30.4
## 3   Qn1 Quebec nonchilled  250   34.8
## 4   Qn1 Quebec nonchilled  350   37.2
## 5   Qn1 Quebec nonchilled  500   35.3
## 6   Qn1 Quebec nonchilled  675   39.2
```

```
install.packages("ggplot2")
```

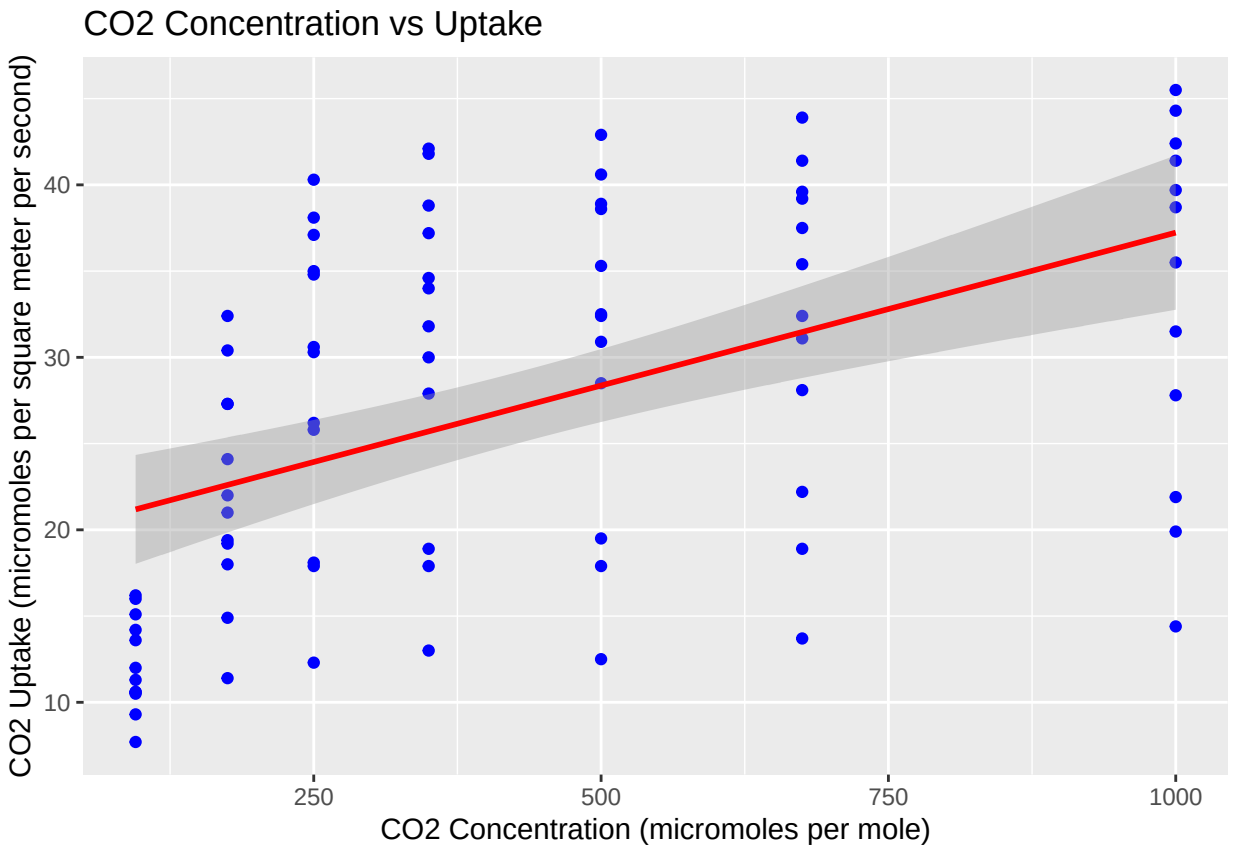
```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.4'
## (as 'lib' is unspecified)
```

```
library(ggplot2)

## HOW DOES CO2 CONCENTRATION AFFECT CO2 UPTAKE IN PLANTS

# Create the scatter plot using ggplot
ggplot(data = CO2, mapping = aes(x = conc, y = uptake)) +
  geom_point(color = "blue") +
  labs(title = "CO2 Concentration vs Uptake",
       x = "CO2 Concentration (micromoles per mole)",
       y = "CO2 Uptake (micromoles per square meter per second)") +
  geom_smooth(method = "lm", color = "red")
```

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



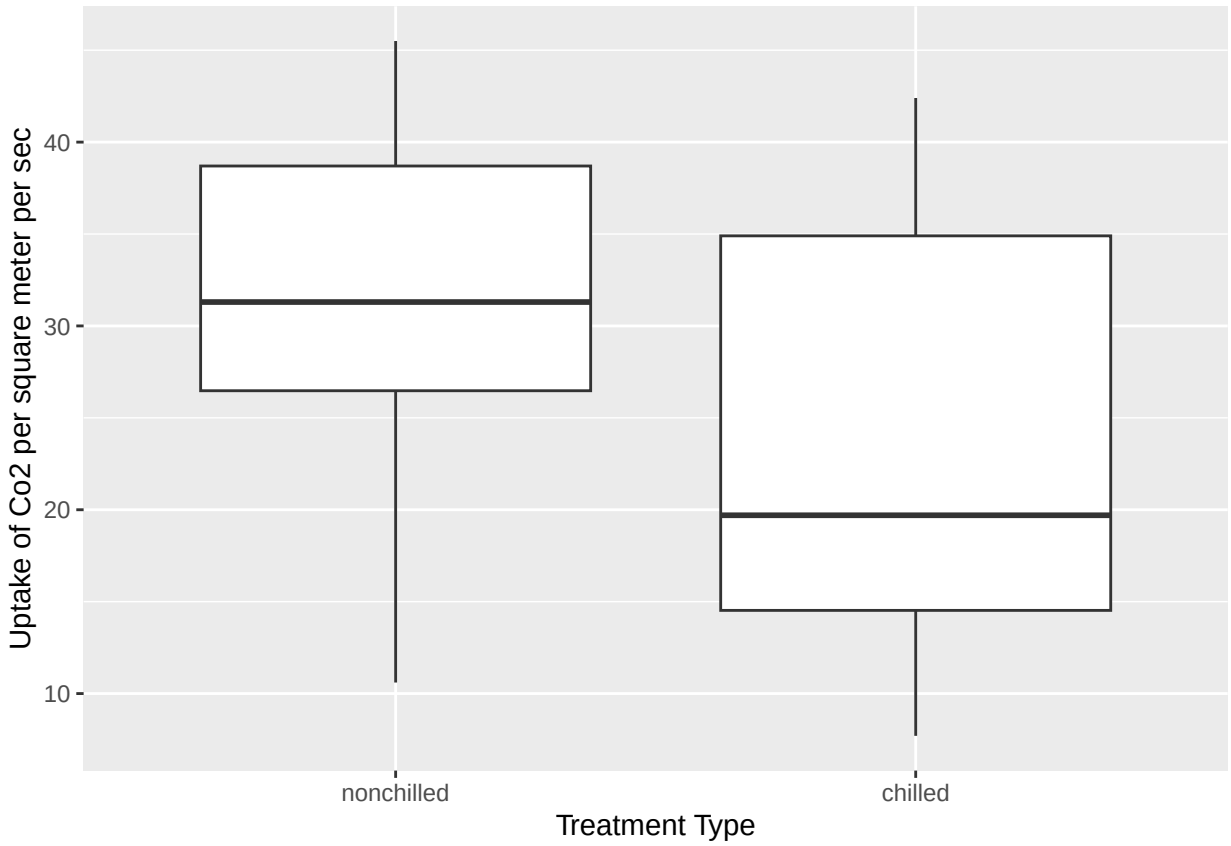

```
# Calculate the correlation
cor(CO2$conc, CO2$uptake)
```

```
## [1] 0.4851774
```

```
# HOW DOES TREATMENT AFFECT CO2 UPTAKE

# Box plot to show effect

ggplot(data=CO2, mapping=aes(x=Treatment, y=uptake))+geom_boxplot()+
  labs(Title="How Treatment affects Co2 Uptake",
       x= "Treatment Type",
       y="Uptake of Co2 per square meter per sec")
```

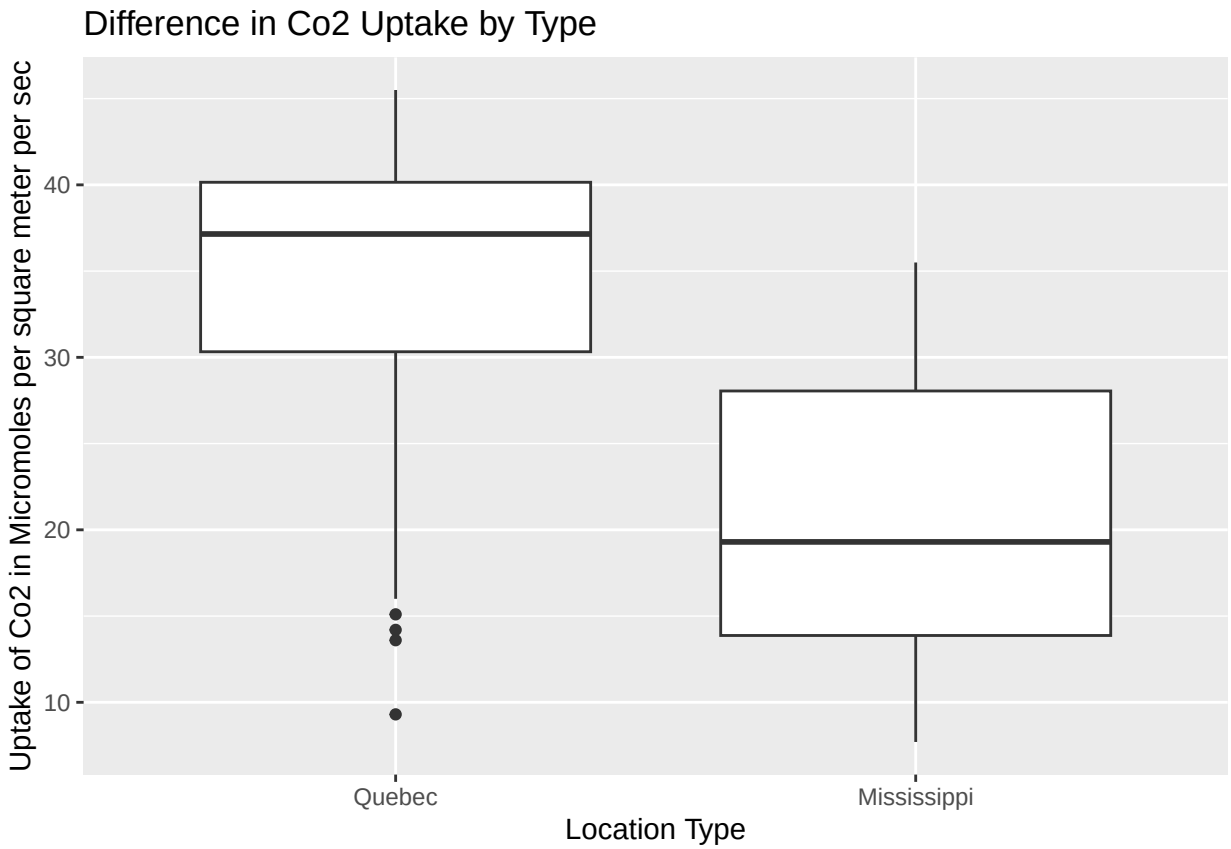



```
# Perform a t-test
t.test(uptake~Treatment, data=CO2)
```

```
##
##  Welch Two Sample t-test
##
## data:  uptake by Treatment
## t = 3.0485, df = 80.945, p-value = 0.003107
## alternative hypothesis: true difference in means between group nonchilled and group chilled is not e
## 95 percent confidence interval:
##   2.382366 11.336682
## sample estimates:
## mean in group nonchilled    mean in group chilled
##                 30.64286                 23.78333
```

```
## WHAT IS THE DIFFERENCE IN CO2 UPTAKE BETWEN PLANTS GROWN IN QUEBEC AND MISSISIPI

# Box plot of CO2 Uptake by Type
ggplot(data=CO2, mapping=aes(x=Type, y= uptake))+geom_boxplot()+
  labs(title = "Difference in Co2 Uptake by Type",
       x= "Location Type",
       y="Uptake of Co2 in Micromoles per square meter per sec")
```




```
# Perform a t-test
t.test(uptake ~ Type, data=CO2)
```

```
##
##  Welch Two Sample t-test
##
## data:  uptake by Type
## t = 6.5969, df = 78.533, p-value = 4.451e-09
## alternative hypothesis: true difference in means between group Quebec and group Mississippi is not e
## 95 percent confidence interval:
##   8.839475 16.479572
## sample estimates:
##      mean in group Quebec mean in group Mississippi
##                  33.54286                  20.88333
```