

# Assignment 2

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```
# Installing necessary package(s)
install.packages("ggplot2")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.5'
## (as 'lib' is unspecified)
install.packages("dplyr")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.5'
## (as 'lib' is unspecified)
install.packages("ggbeeswarm")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.5'
## (as 'lib' is unspecified)
library(ggbeeswarm)

## Loading required package: ggplot2
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
library(ggplot2)
```

## Dataset

The **BreastCancer** dataset contains cytological measurements of breast tissue samples, used to classify tumors as benign or malignant. It includes numerical features describing cell characteristics derived from microscopic examination.

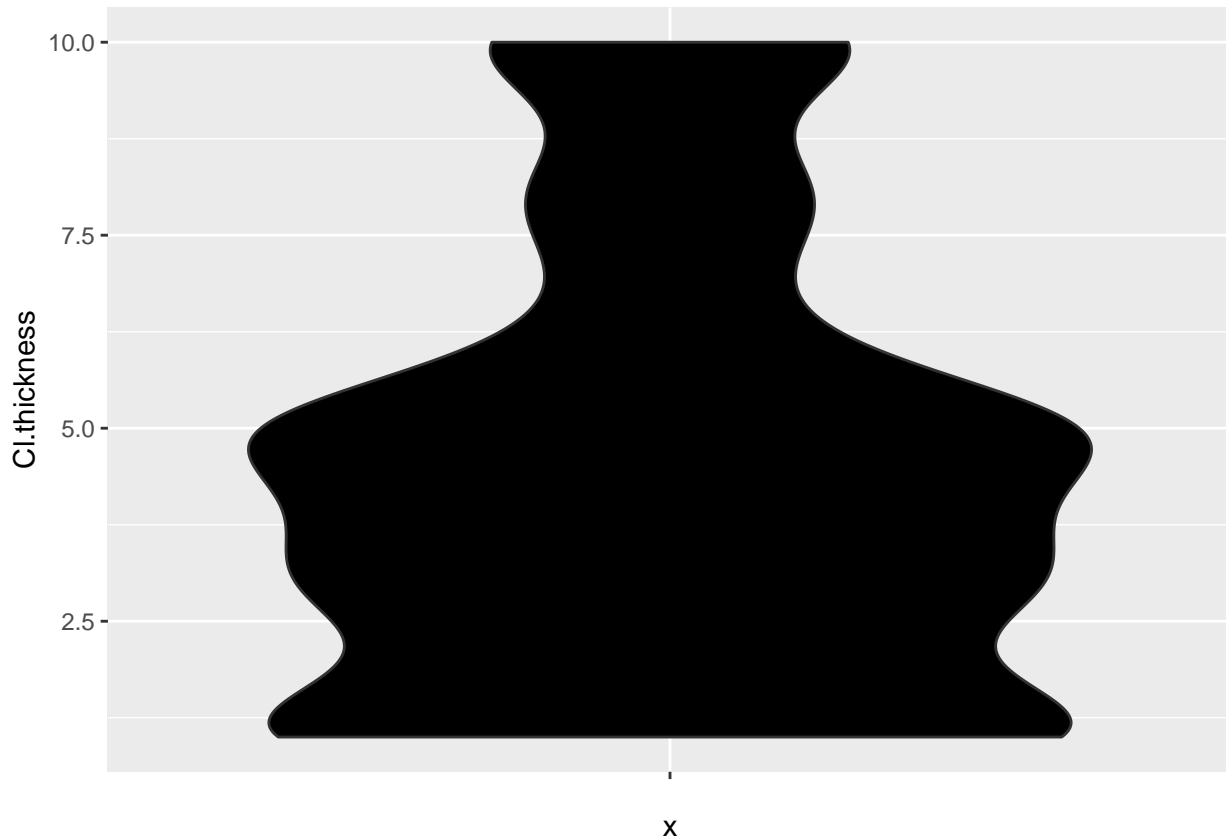
To load the dataset to your environment, just run the code below:

```
install.packages("mlbench")
library(mlbench)
data("BreastCancer")
BreastCancer$Cl.thickness <- as.numeric(BreastCancer$Cl.thickness)
```

## Drawing a plot for distribution

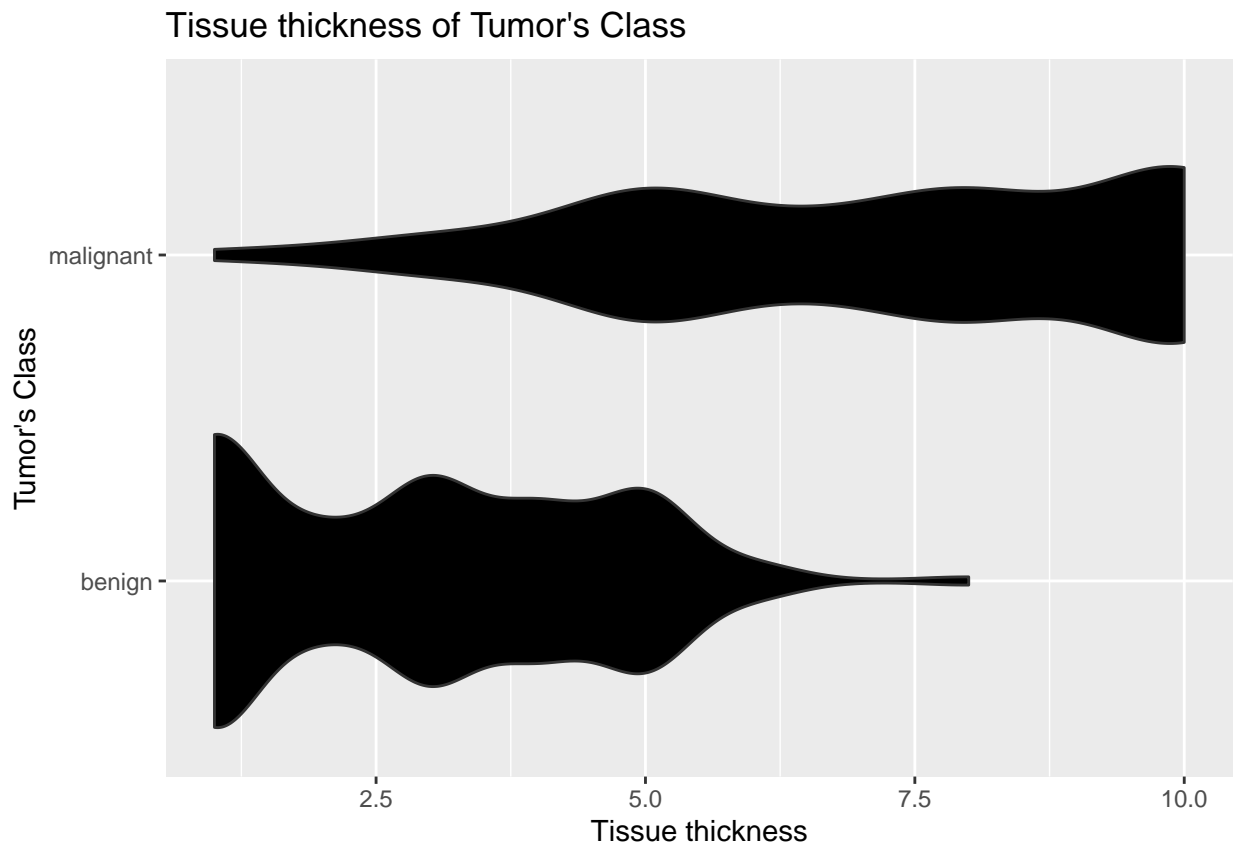
1. Please draw a plot to visualize the distribution of tissue thickness (`Cl.thickness`) of the patients according to `Class` indicating whether the tumor in the breast tissue is benign or malignant. (40 pts).

```
ggplot(BreastCancer, aes(x= "", y= Cl.thickness ))+  
  geom_violin(fill = "black" , )
```



2. Please solve the problems in the plot and make it better by adding some information (30 pts).

```
ggplot(BreastCancer, aes(y= Class, x= Cl.thickness ))+  
  geom_violin( fill = "black")+  
  labs (x = "Tissue thickness",  
        y = "Tumor's Class",  
        title = "Tissue thickness of Tumor's Class") +  
  lims(x= c(1,10))
```



3. Interpret the plot (30 pts). Tissue thickness increases, tumors could be malignant. ...