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title: "Todd_Garner_DS6306_Week7_Part2_Iris"
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date: "2023-02-15"
output: html_document
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```{r setup, include=FALSE}
knitr::opts_chunk$set(echo = TRUE)
knitr::opts_chunk$set(dev = c('pdf', 'png'),
 fig.align = 'center', fig.height = 5, fig.width = 8.5,
 pdf.options(encoding = "ISOLatin9.enc"))

library(class)
library(caret)
library(e1071)
library(dplyr)
library(jsonlite)
library(ggplot2)
library(ggthemes)
library(tidyverse)
library(gridExtra)
```

# Part 2, Iris

```{r}
#View(iris)
iris_clean = iris %>% filter(!is.na(Sepal.Length) & !is.na(Sepal.Width))
iterations = 100

for(i in 1:iterations) {
 set.seed(i)
 trainiris =
 sample(seq(1:length(iris_clean$Sepal.Length)),round(.7*length(iris_clean$Sepal.Length)))
 trainIris = iris_clean[trainiris,]
 testIris = iris_clean[-trainiris,]
 head(trainiris)
 head(testIris)

 model <- naiveBayes(trainIris,as.factor(trainIris$Sepal.Length & trainIris$Sepal.Width),
 laplace = 1) # & trainIris$Sepal.Width
 head(model)
 df <- data.frame(testIris)
 head(df)
 x <- round(predict(model, df, type = "raw"), digits = 1)
 x
 y <- x[,2]
 y
 master_sens[,i] = sensitivity(factor(y), factor(df$Sepal.Length))
 master_spec[,i] = specificity(factor(y), factor(df$Sepal.Length))
 CM <- confusionMatrix(factor(y), factor(df$Sepal.Length), k = i)
 master_acc[,i] = CM$overall
}

mean_sens = colMeans(master_sens)
mean_spec = colMeans(master_spec)
mean_acc = colMeans(master_acc)

which.max(mean_sens)
max(mean_sens)
which.max(mean_spec)
max(mean_spec)
which.max(mean_acc)

```

```
max(mean_acc)
```

```
...
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