

# LDA with Fisher's Iris Data

Three classes in the Iris dataset:

- Iris-setosa (n=50)
- Iris-versicolor (n=50)
- Iris-virginica (n=50)



*Iris setosa*



*Iris versicolor*



*Iris virginica*

Four features of the Iris dataset:

- sepal length in cm
- sepal width in cm
- petal length in cm
- petal width in cm

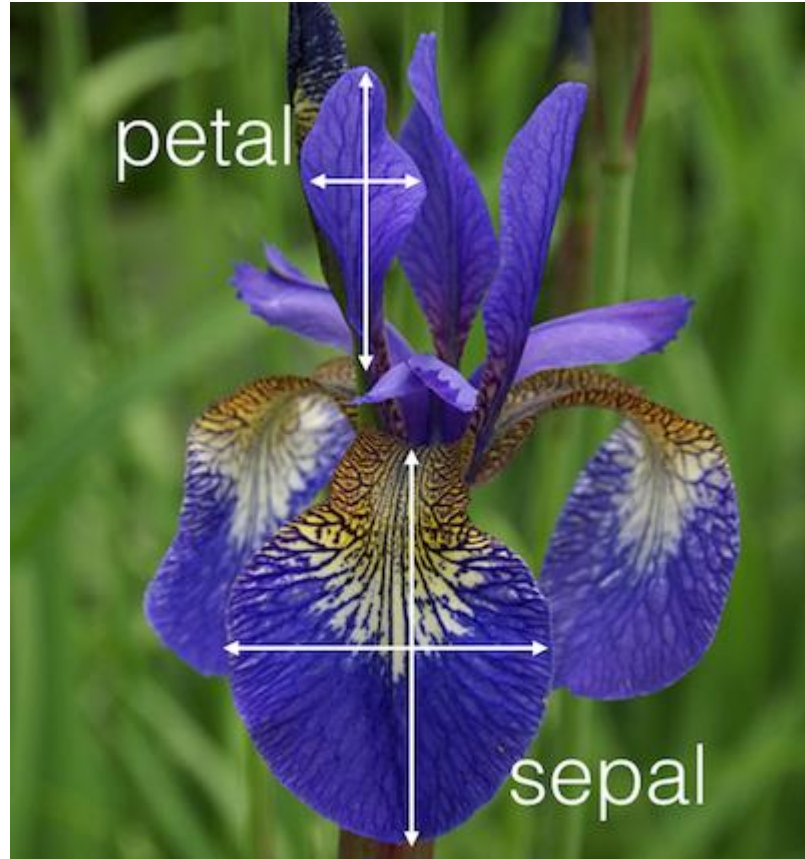
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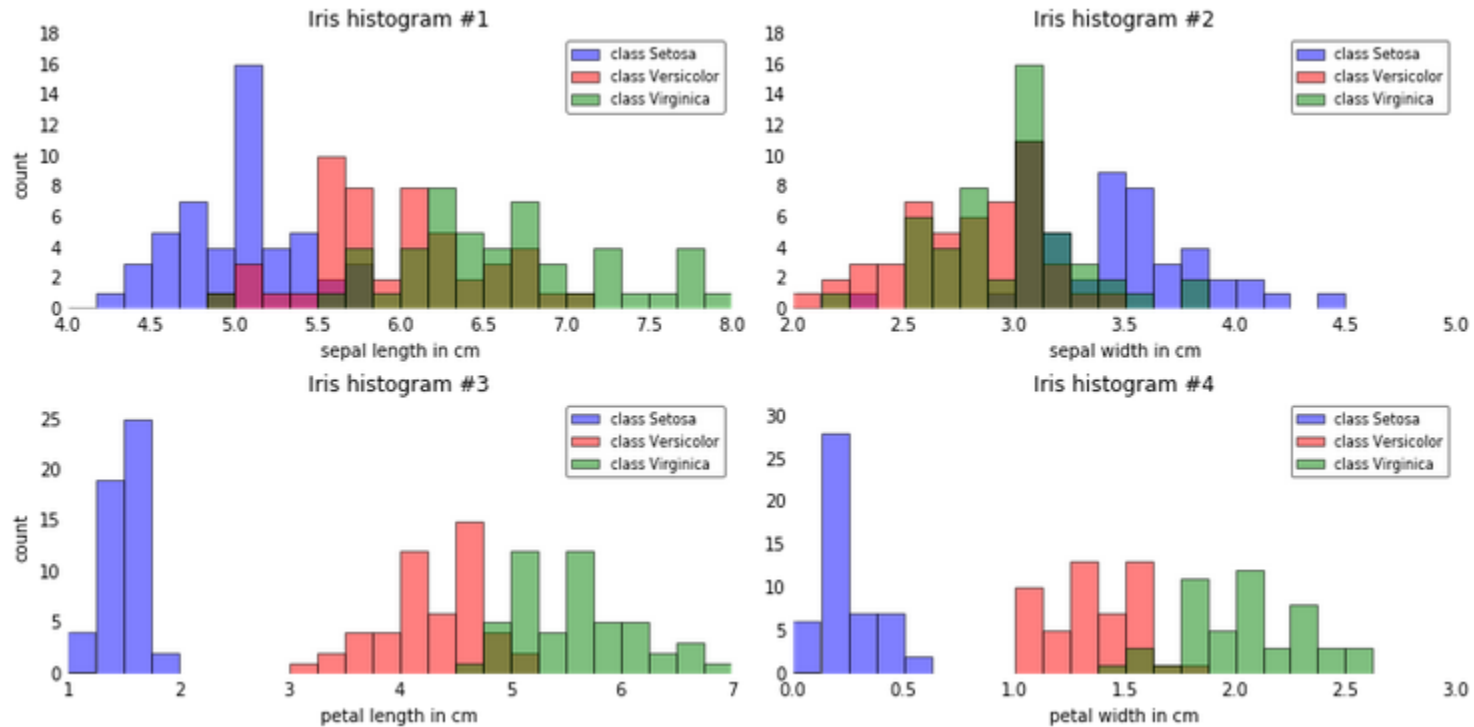
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# LDA with Fisher's Iris Data



```
require(MASS); data(iris); head(iris, 3)
```

```
lda.mod <- lda(Species ~ ., data = iris, prior = c(1,1,1)/3) # prior → pi_k
```

```
lda.pred <- predict(lda.mod,iris)
```

```
lda.pred.class <- lda.pred$class
```

```
table(lda.pred.class,iris$Species) # "confusion matrix"
```

```
lda.detail <- bind(as.character(lda.pred$class), round(lda.pred$posterior,8))
```

```
lda.detail #134
```

```
plot(lda.pred$x[,1], lda.pred$x[,2], col=iris$Species) # OR plot(lda.mod)
```

# LDA with Fisher's Iris Data

```
> lda.mod
```

```
Call: lda(Species ~ ., data = iris)
```

```
Prior probabilities of groups:
```

```
  setosa  versicolor  virginica  
0.3333333 0.3333333 0.3333333
```

```
Group means:
```

	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width
setosa	5.006	3.428	1.462	0.246
versicolor	5.936	2.770	4.260	1.326
virginica	6.588	2.974	5.552	2.026

```
Coefficients of linear discriminants:
```

	LD1	LD2
Sepal.Length	0.8293776	0.02410215
Sepal.Width	1.5344731	2.16452123
Petal.Length	-2.2012117	-0.93192121
Petal.Width	-2.8104603	2.83918785

```
Proportion of trace:
```

```
  LD1  LD2  
0.9912 0.0088
```