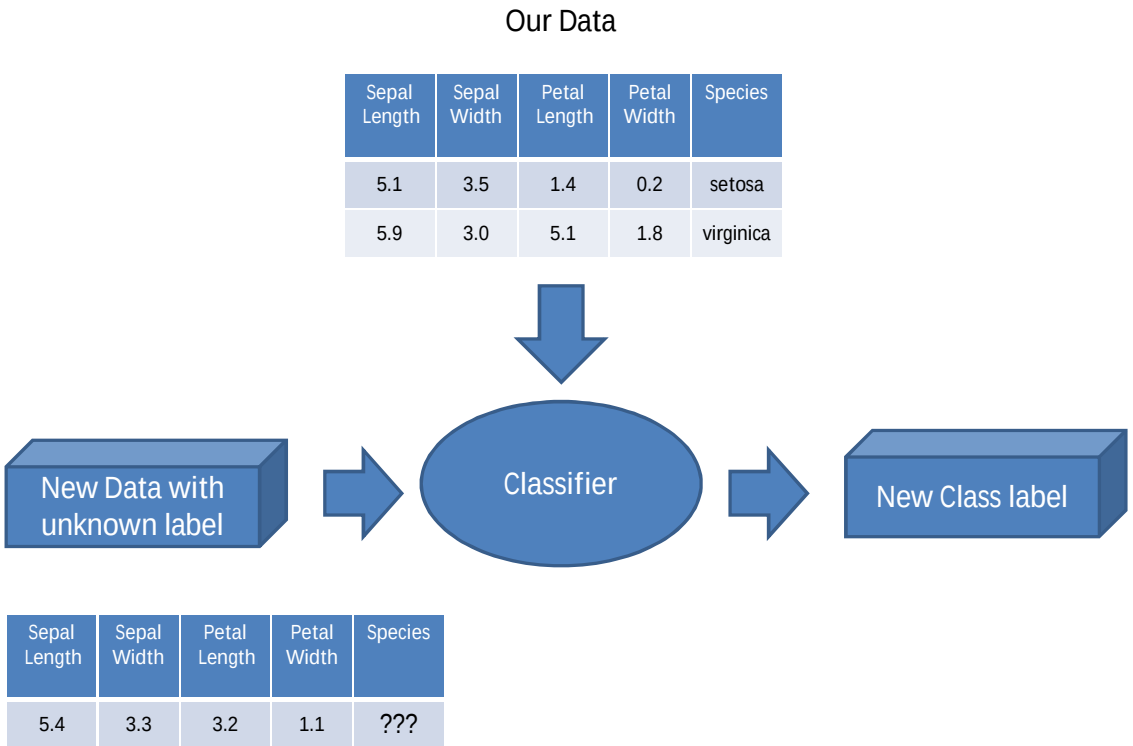
Introduction to Machine Learning

Classification: Tasks

compstat-lmu.github.io/lecture_i2ml

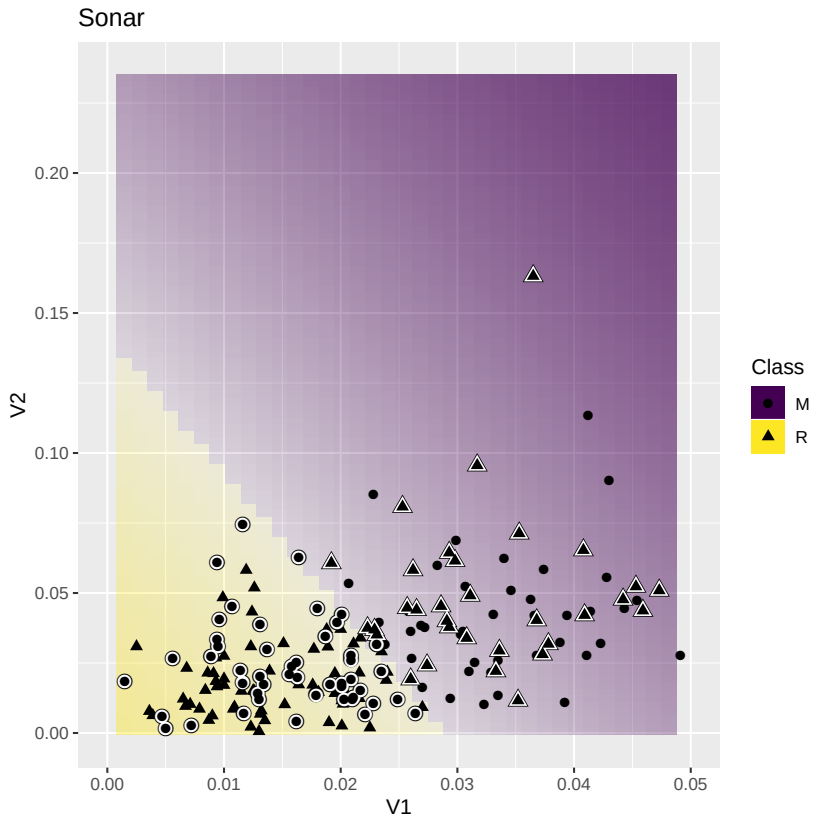
CLASSIFICATION

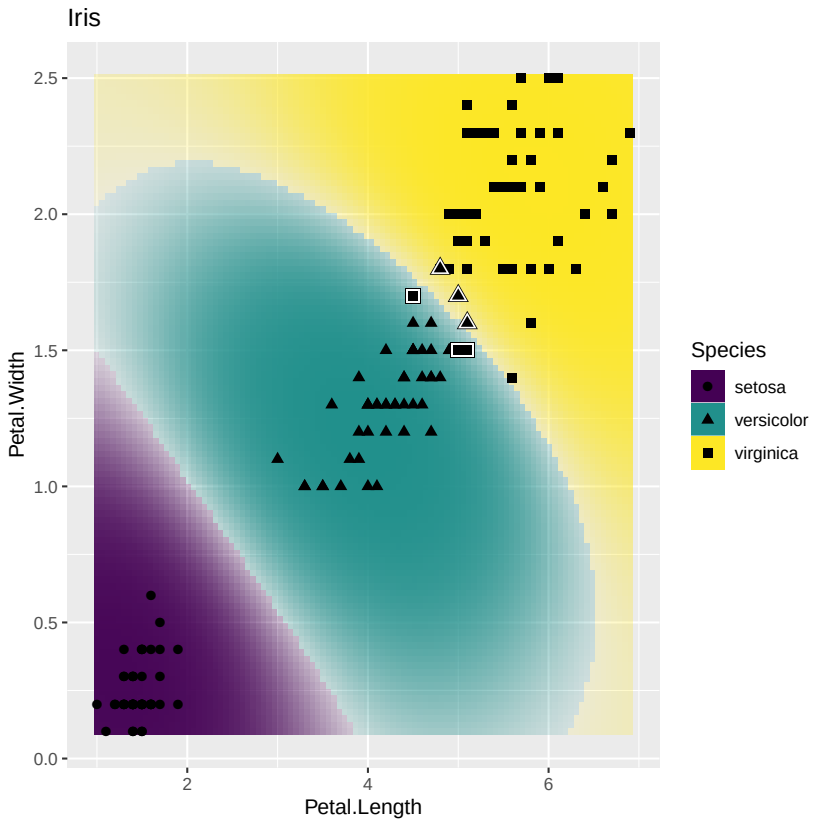
Learn functions that assign class labels to observation / feature vectors. Each observation belongs to exactly one class. The main difference to regression is the scale of the output / label.



BINARY AND MULTICLASS TASKS

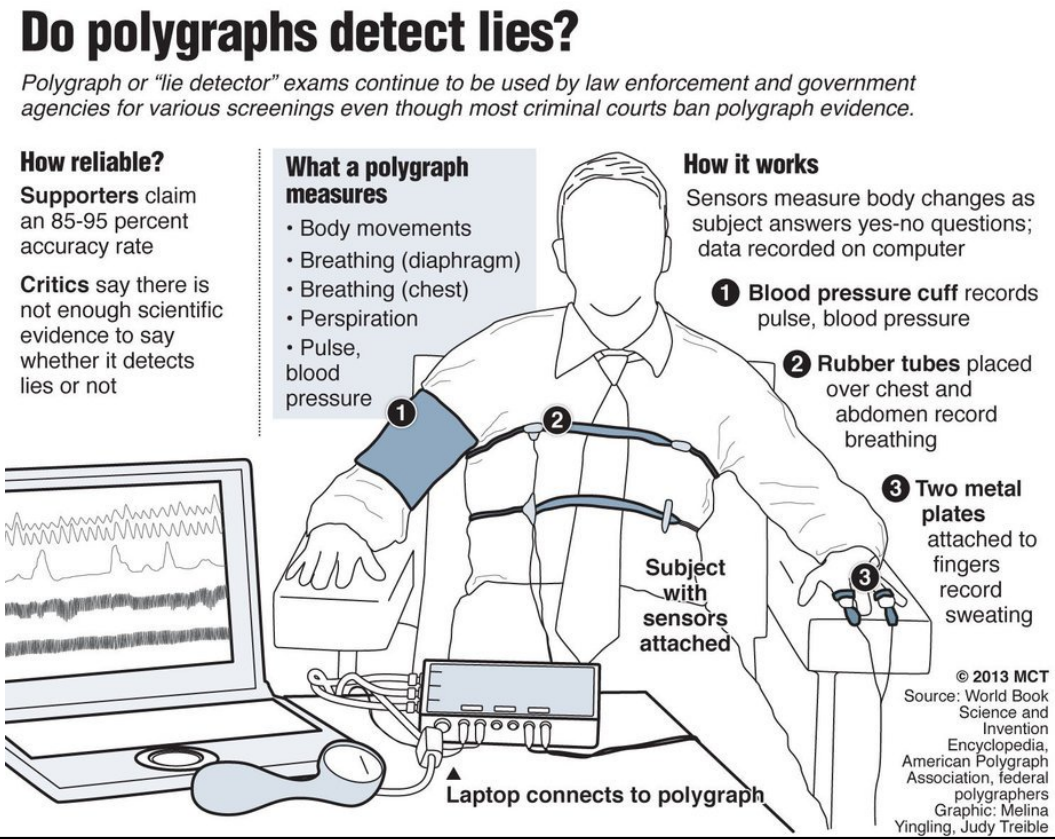
The task can contain 2 classes (binary) or multiple (multiclass).





BINARY CLASSIFICATION TASK - EXAMPLES

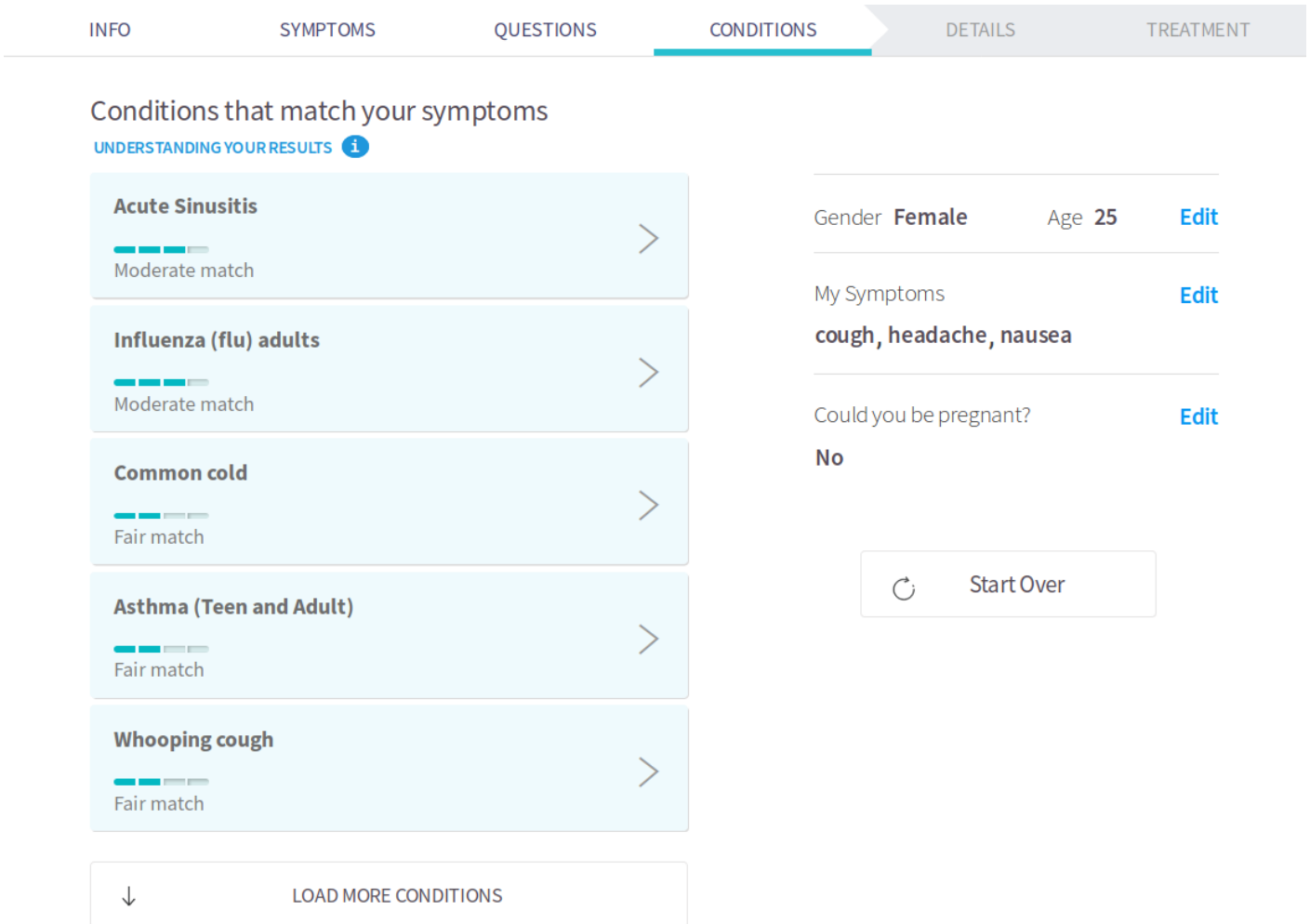
- Credit risk prediction, based on personal data and transactions
- Spam detection based on textual features
- Churn prediction based on customer behavior
- Predisposition for specific illness based on genetic data



BINARY CLASSIFICATION TASK - EXAMPLES

https://www.bendbulletin.com/localstate/deschutescounty/3430324-151/fact-or-fiction-polygraphs-just-an-investigative-tool

MULTICLASS TASK - MEDICAL DIAGNOSIS



https://symptoms.webmd.com

MULTICLASS TASK - IRIS

The iris dataset was introduced by the statistician Ronald Fisher and is one of the most frequent used datasets. Originally it was designed for linear discriminant analysis.

Setosa

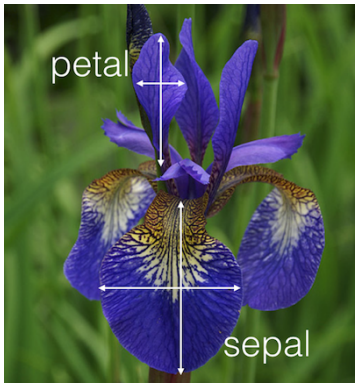
Versicolor

Virginica

Source:
`https://en.wikipedia.org/wiki/Iris_flower_data_set`

MULTICLASS TASK - IRIS

- 150 iris flowers
- Predict subspecies
- Based on sepal and petal length / width in [cm]




```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
##   1:          5.1         3.5          1.4         0.2    setosa
##   2:          4.9         3.0          1.4         0.2    setosa
##   3:          4.7         3.2          1.3         0.2    setosa
##   4:          4.6         3.1          1.5         0.2    setosa
##   5:          5.0         3.6          1.4         0.2    setosa
##  ---
## 146:          6.7         3.0          5.2         2.3 virginica
## 147:          6.3         2.5          5.0         1.9 virginica
## 148:          6.5         3.0          5.2         2.0 virginica
## 149:          6.2         3.4          5.4         2.3 virginica
## 150:          5.9         3.0          5.1         1.8 virginica
```

MULTICLASS TASK - IRIS