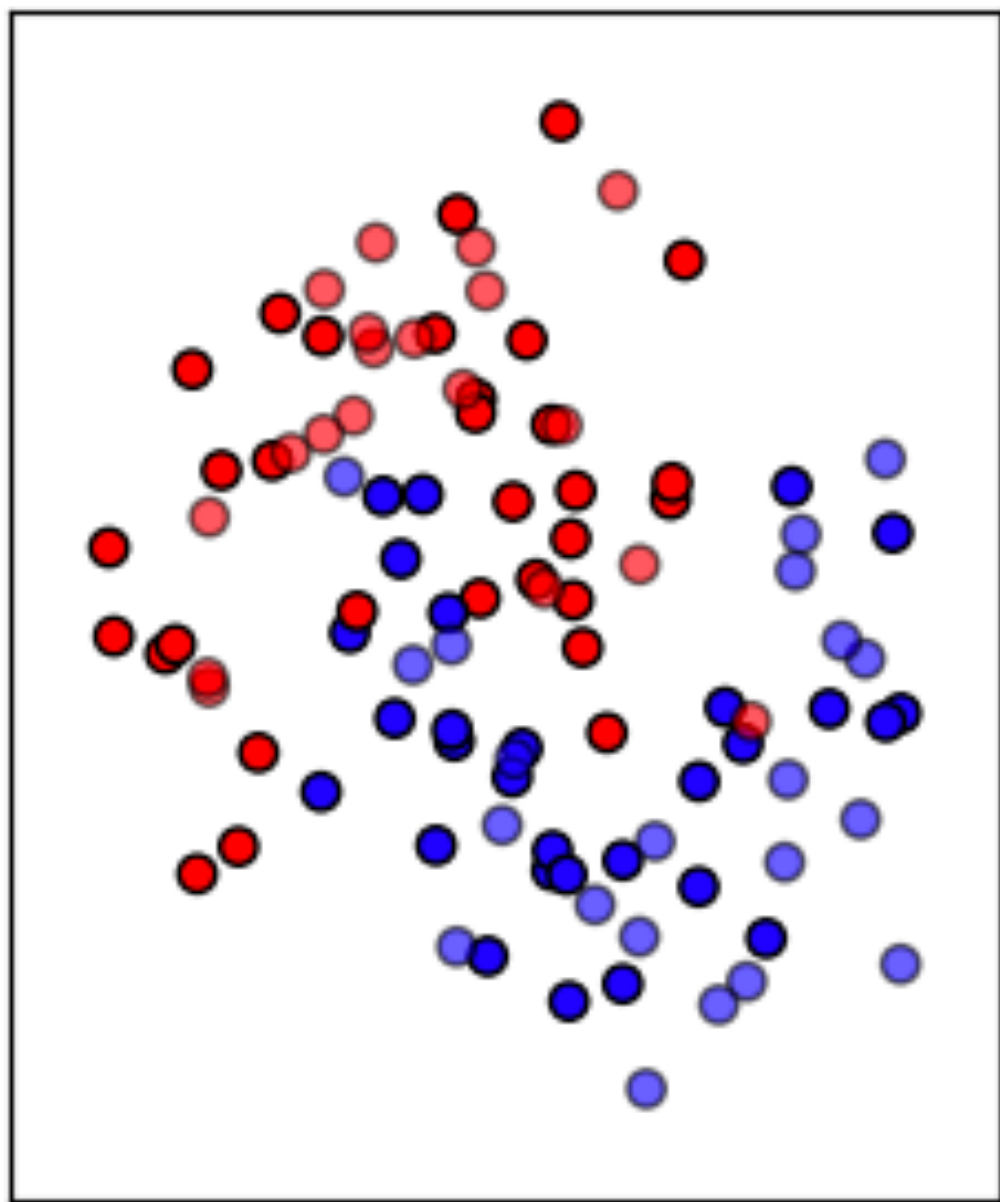
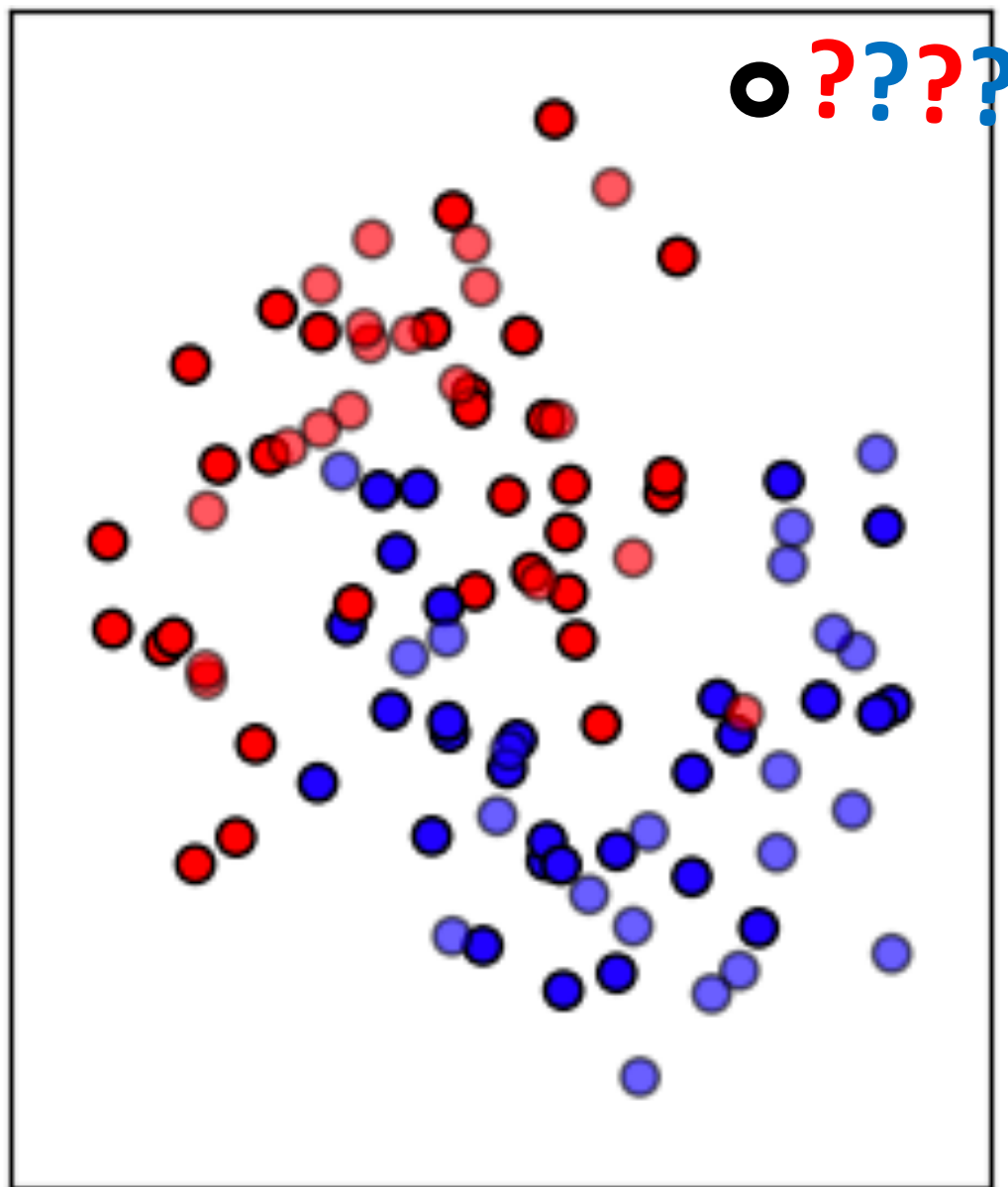
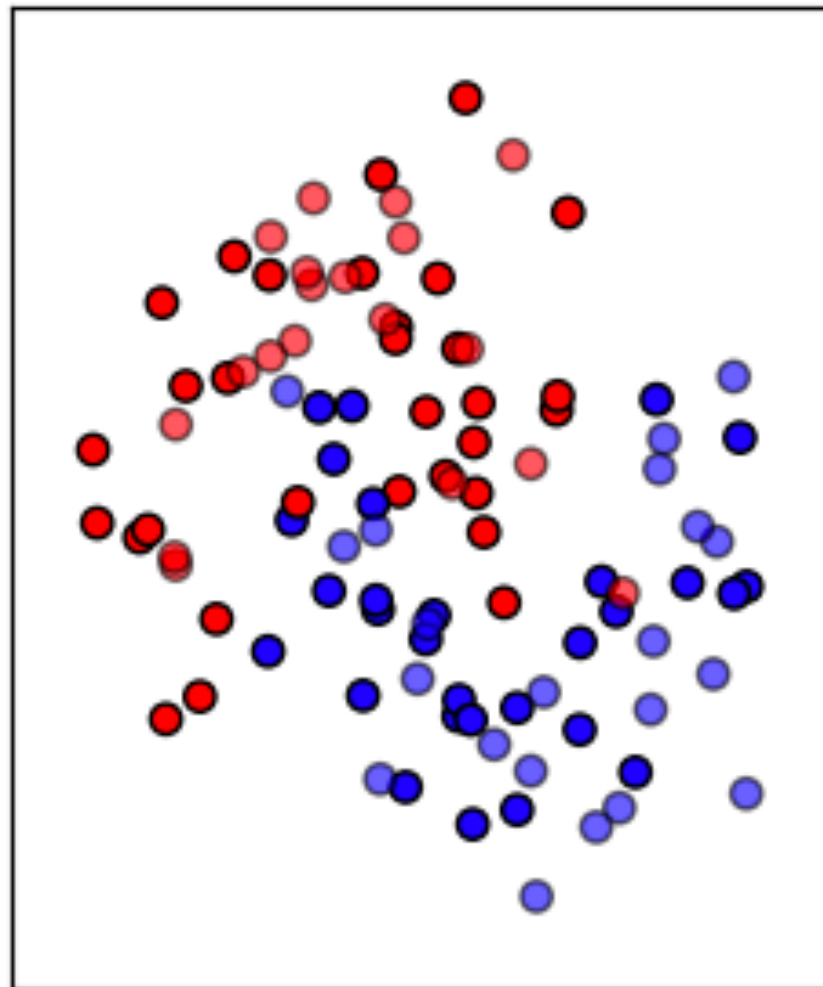


Intro to Machine Learning: Supervised Learning Classification and k-Nearest Neighbors

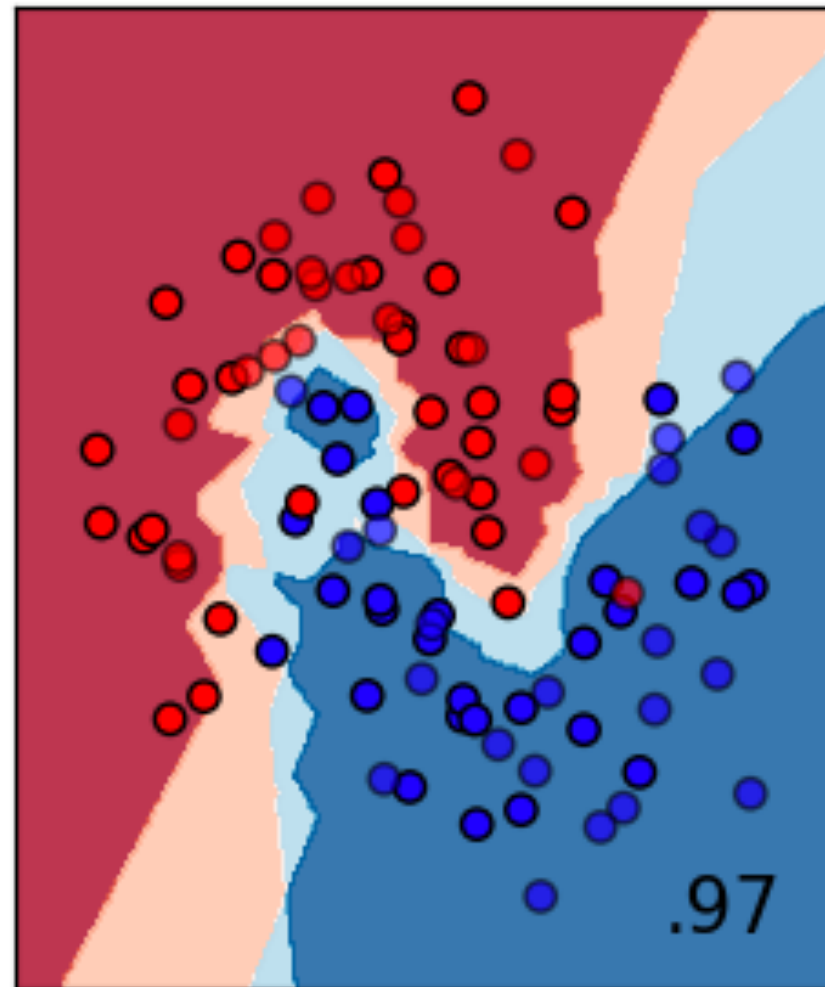




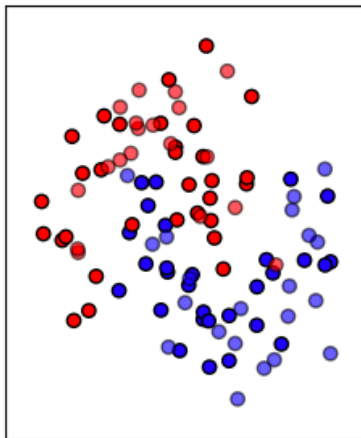
Input data



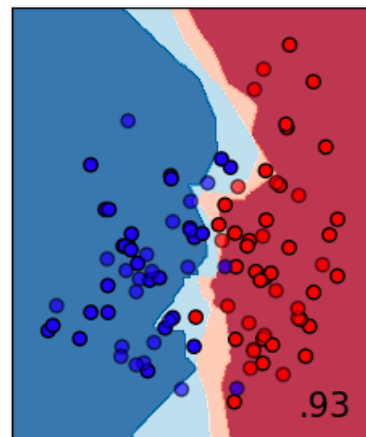
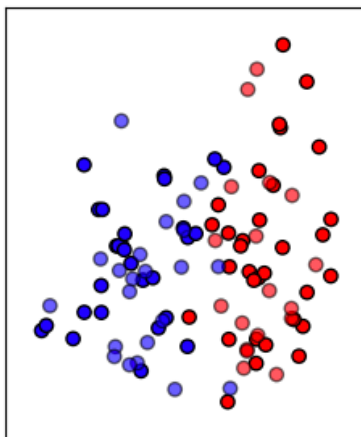
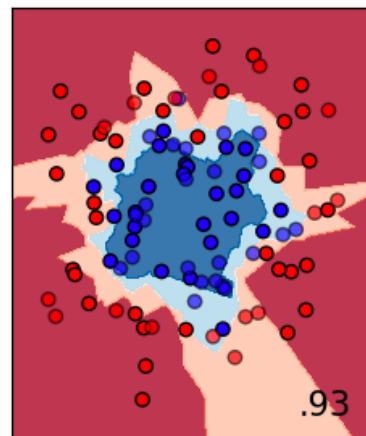
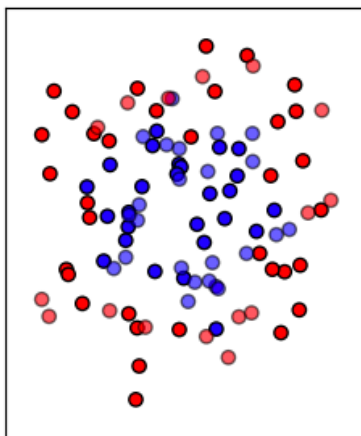
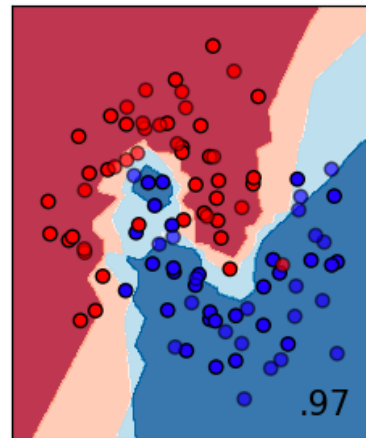
Nearest Neighbors

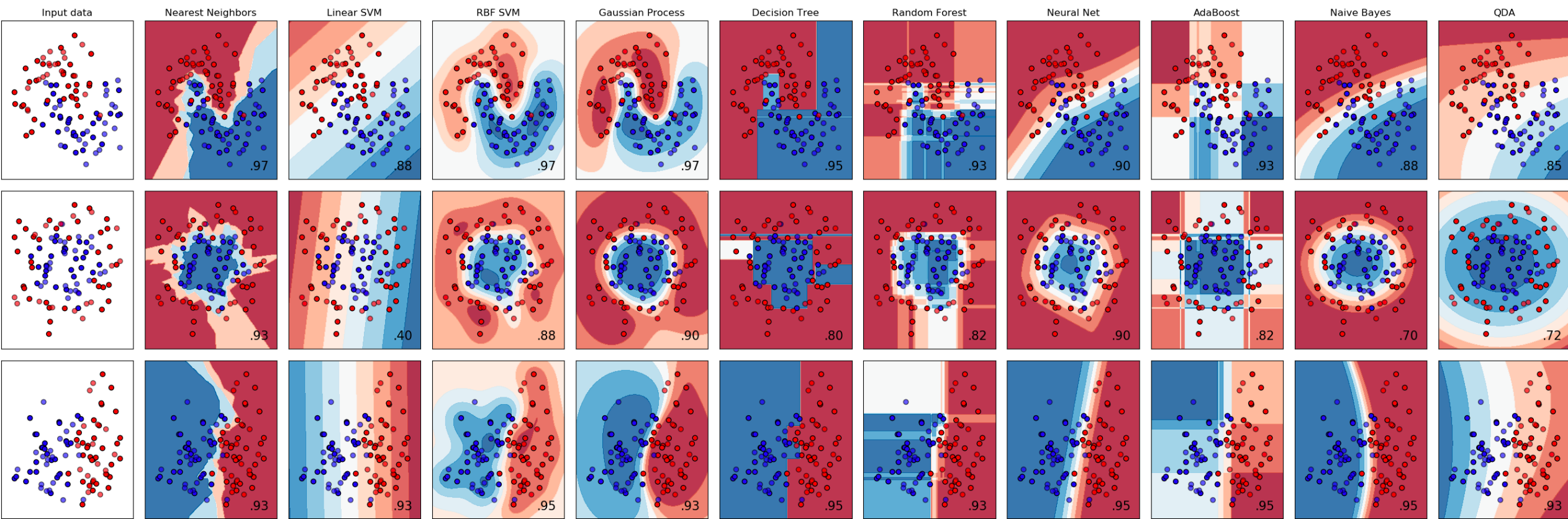


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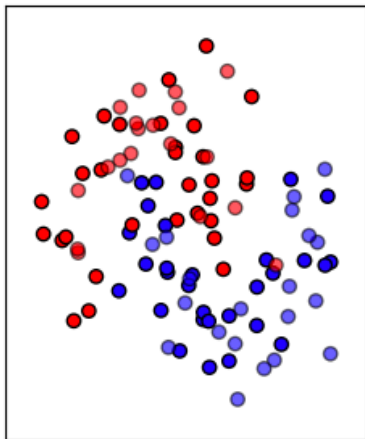


Nearest Neighbors

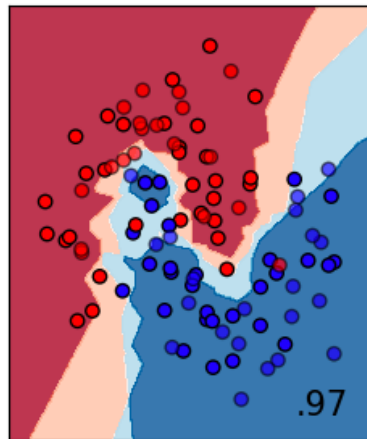




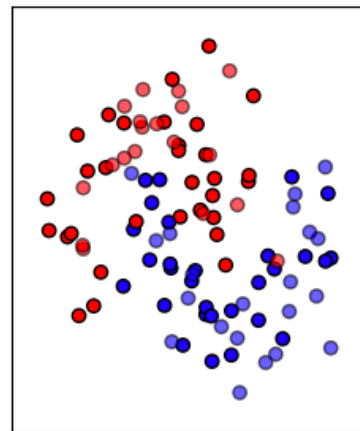
Input data



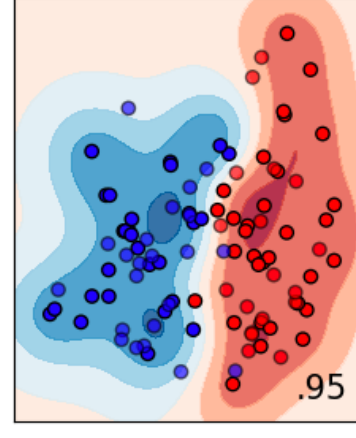
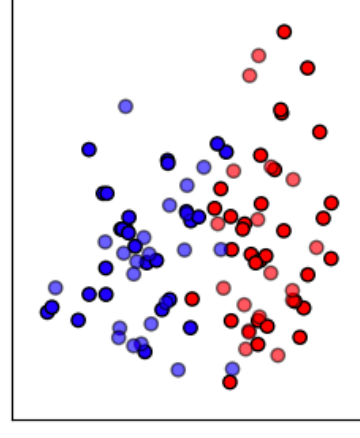
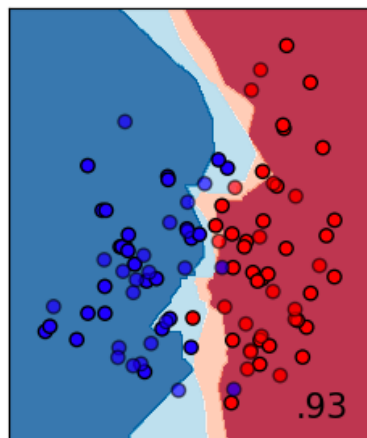
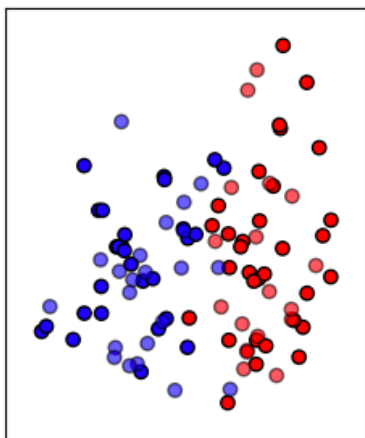
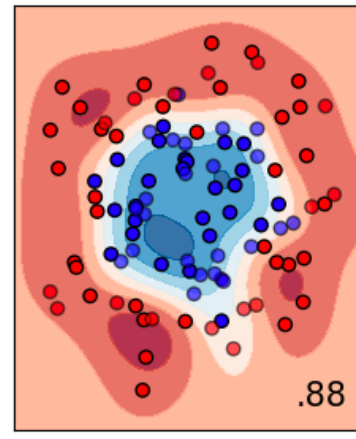
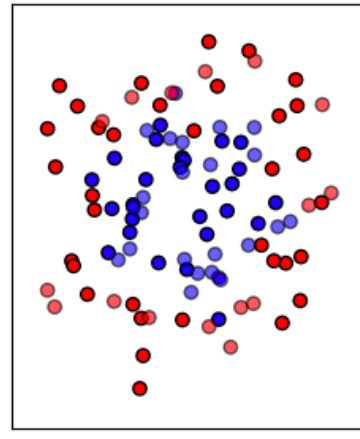
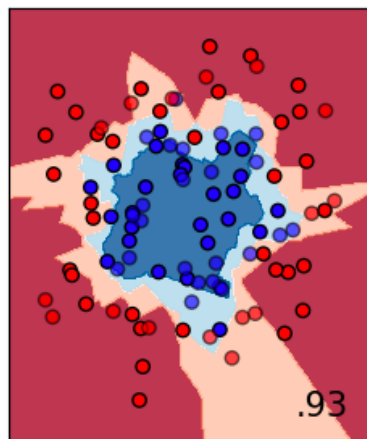
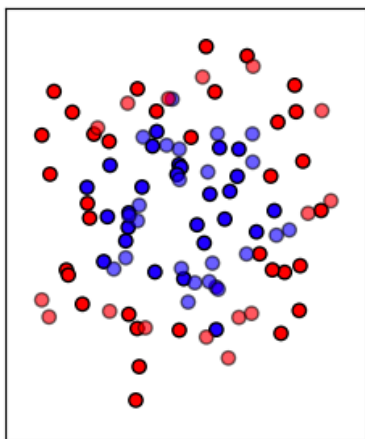
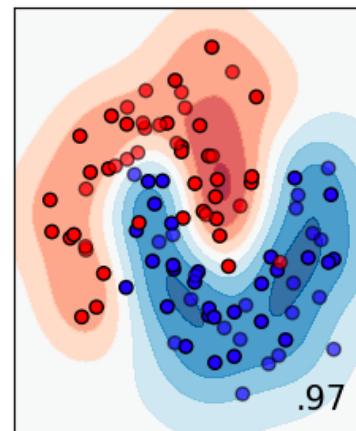
Nearest Neighbors



Input data

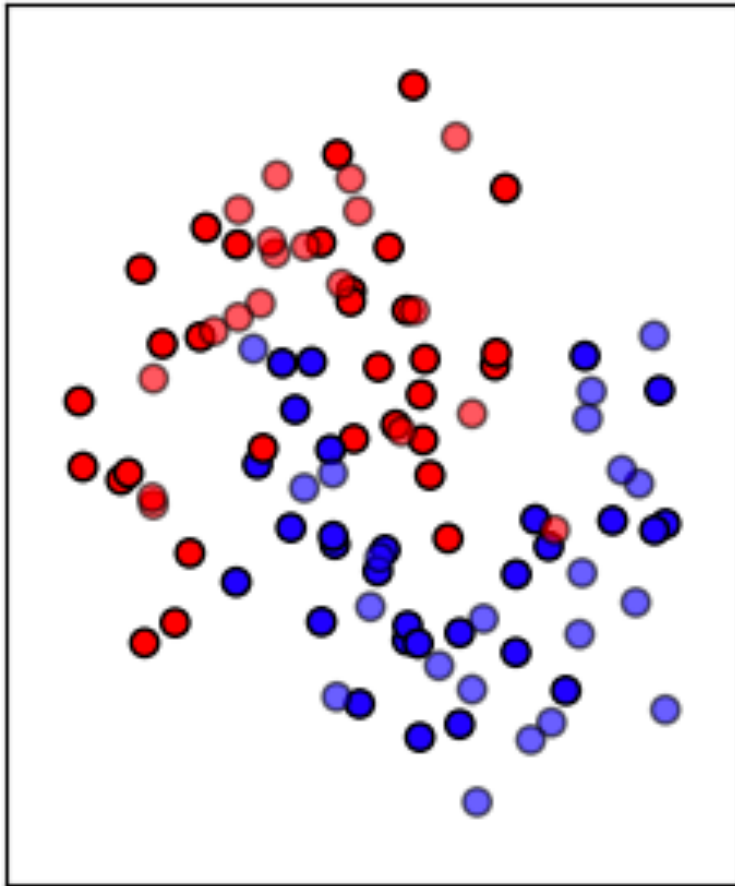


RBF SVM

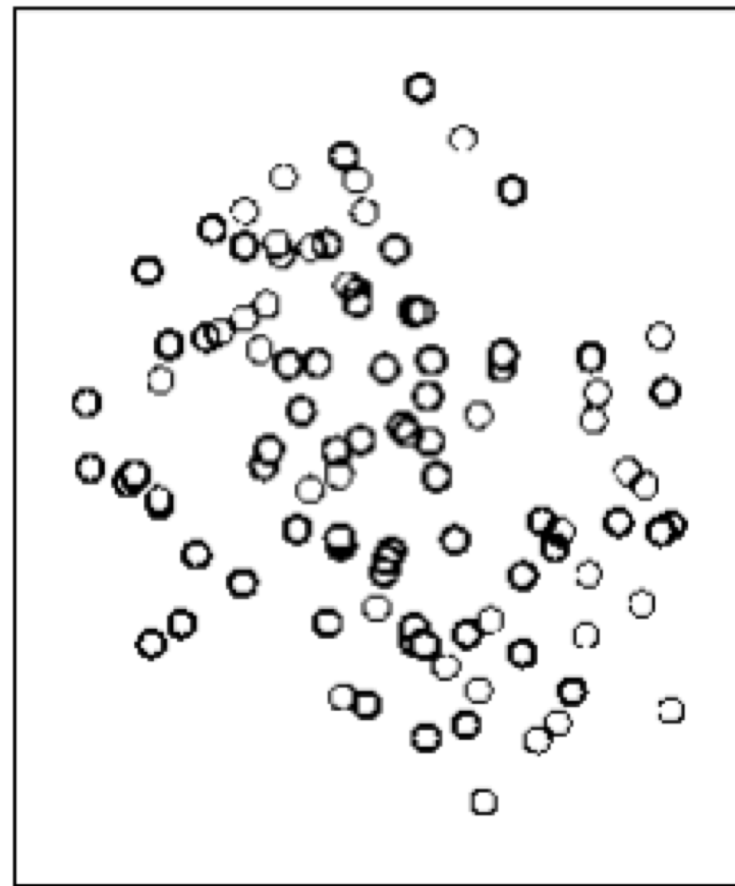


Supervised vs Unsupervised Learning

Input data

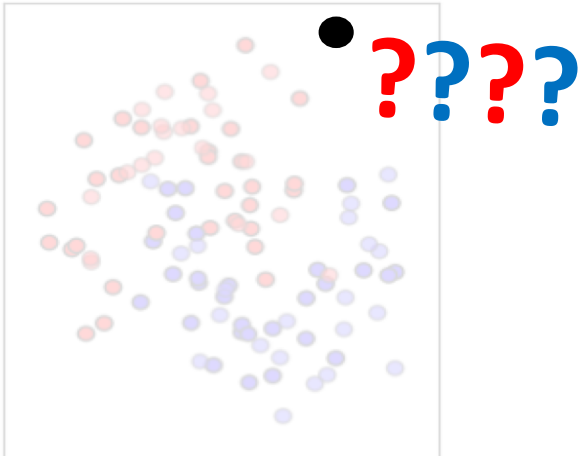


Input data



Nearest Neighbor Classifier

Attributes of
an example

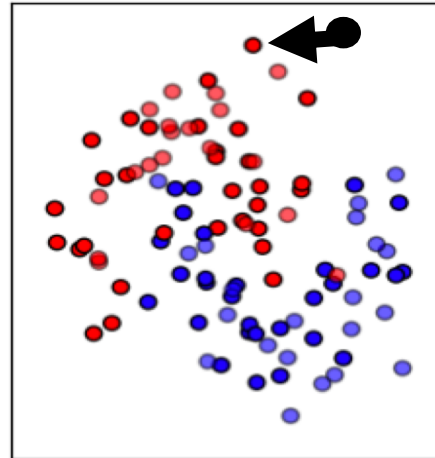
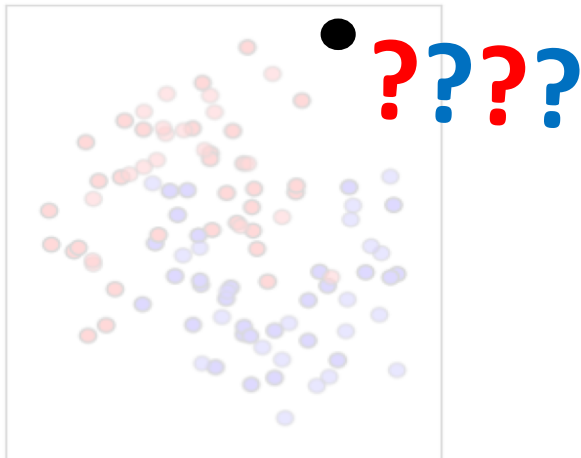


Nearest Neighbor Classifier

Attributes of
an example

NN Classifier

Use the label of
the most similar
training example



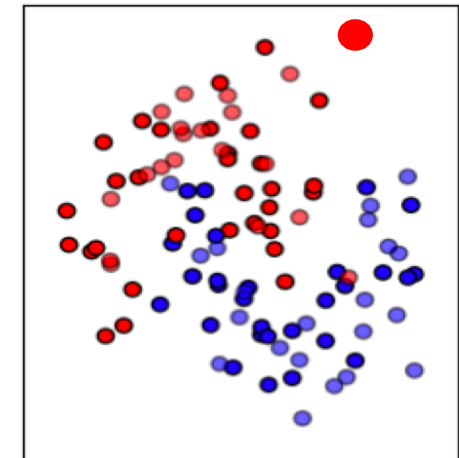
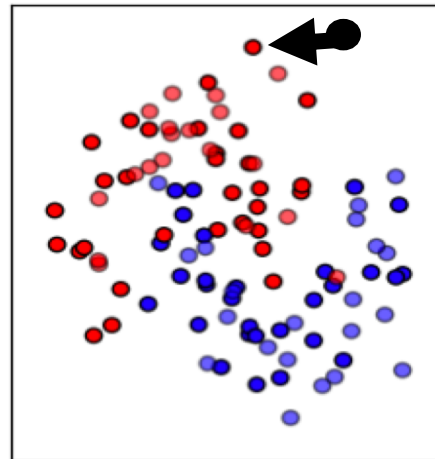
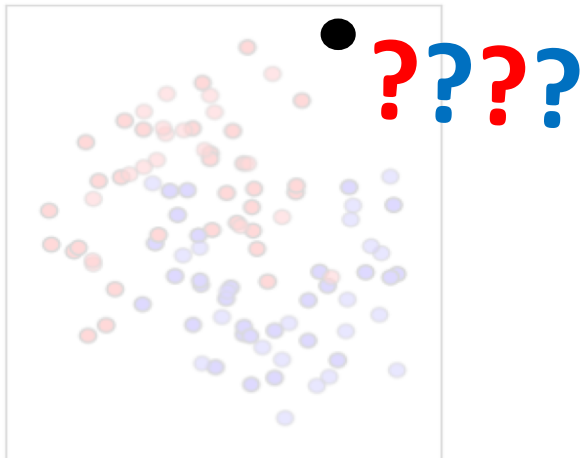
Nearest Neighbor Classifier

Attributes of
an example

NN Classifier

Use the label of
the most similar
training example

Predicted label
of the example



The Classifier

To classify a point:

- Find its k nearest neighbors
- Take a majority vote of the k nearest neighbors to see which of the two classes appears more often
- Assign the point the class that wins the majority vote

(Demo)

Evaluation

Accuracy of a Classifier

The accuracy of a classifier on a labeled data set is the proportion of examples that are labeled correctly

Need to compare classifier predictions to true labels

If the labeled data set is sampled at random from a population, then we can infer accuracy on that population

