

# Support vector machines and K nearest neighbours

## 1. SVM with synthetic data

For this problem, we will generate synthetic data for a nonlinear binary classification problem and partition it into training, validation and test sets. Our goal is to understand the behavior of SVMs with Radial-Basis Function (RBF) kernels with different values of  $C$  and  $\gamma$ .

- a) The effect of the regularization parameter,  $C$
- b) The effect of the RBF kernel parameter,  $\gamma$

## 2. Breast Cancer Diagnosis with Support Vector Machines

<https://scikit-learn.org/stable/modules/generated/sklearn.svm.SVC.html>

## 3. Breast Cancer Diagnosis with –Nearest Neighbours

<https://scikitlearn.org/stable/modules/generated/sklearn.neighbors.KNeighborsClassifier.html>