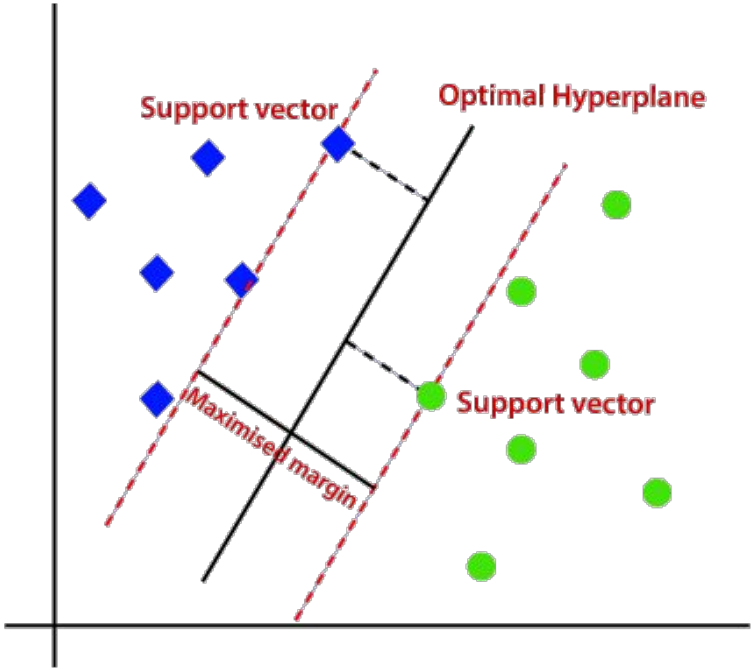
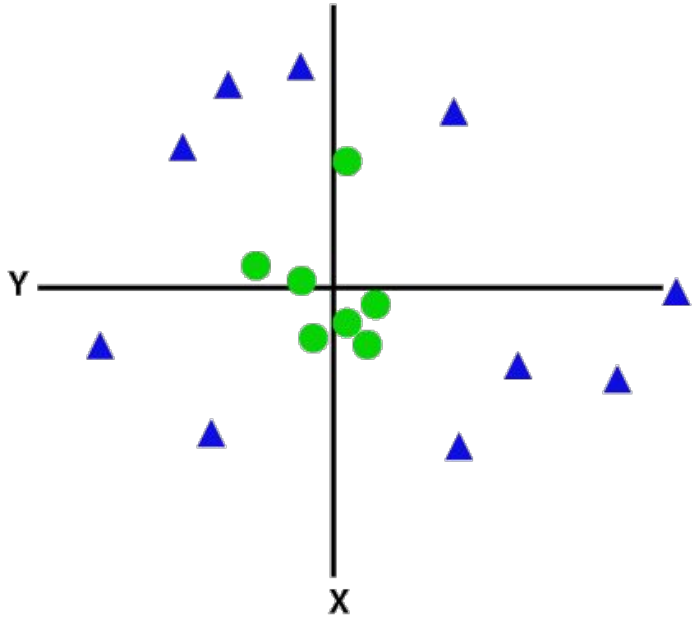
Support Vector Machine

Support Vectors



https://www.javatpoint.com/machine-learning-support-vector-machine-algorithm

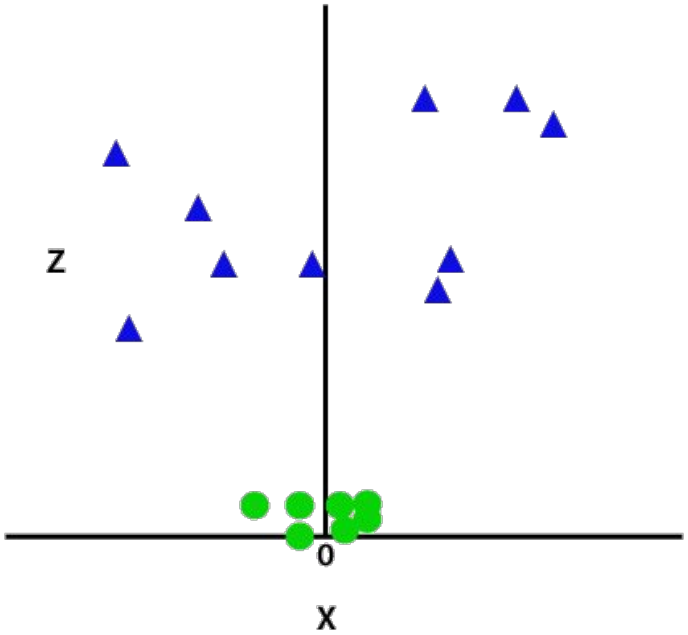
SVM – Classification



https://www.javatpoint.com/machine-learning-support-vector-machine-algorithm

SVM – Classification: New Dimension

$$z = x^2 + y^2$$



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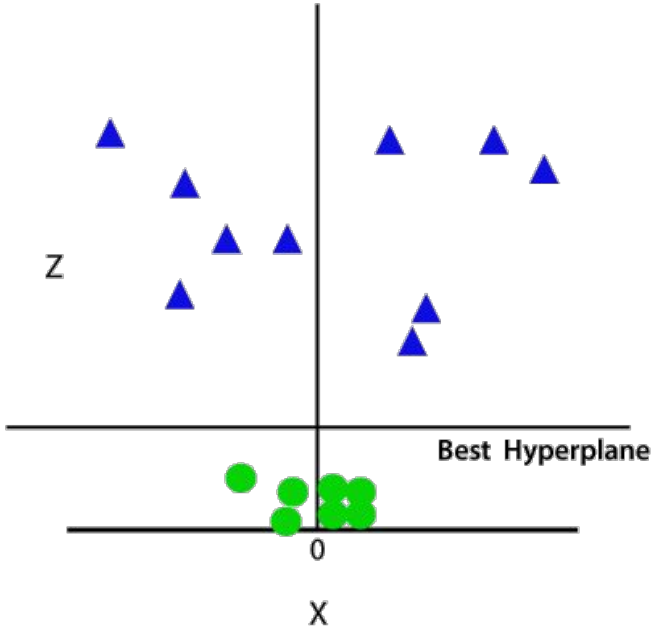
SVM – Classification: Best Hyperplane

$$z = x^2 + y^2$$



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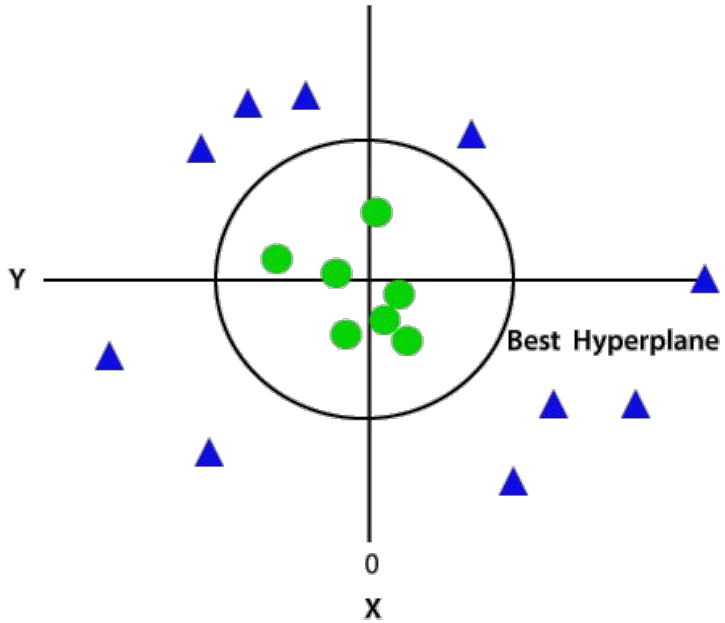
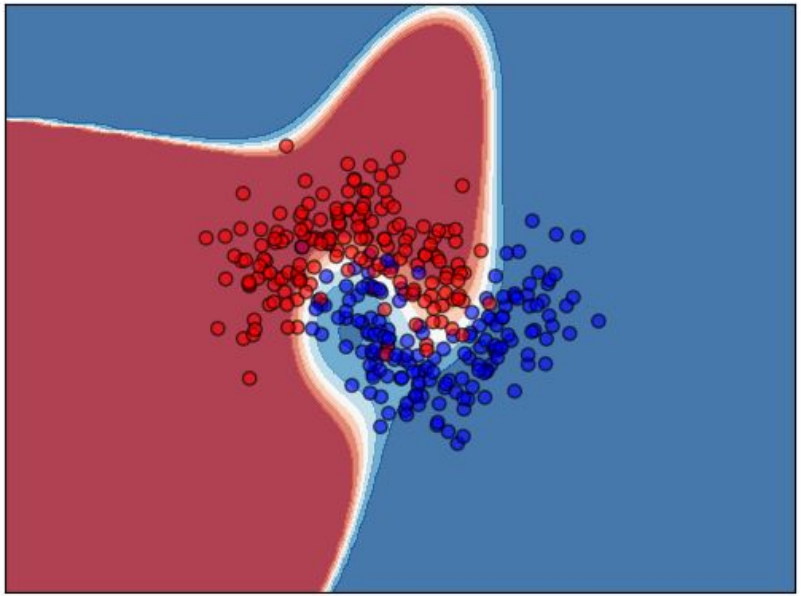
SVM – Classification: Back to Initial Dimensions



https://www.javatpoint.com/machine-learning-support-vector-machine-algorithm

SVM – Overfitting

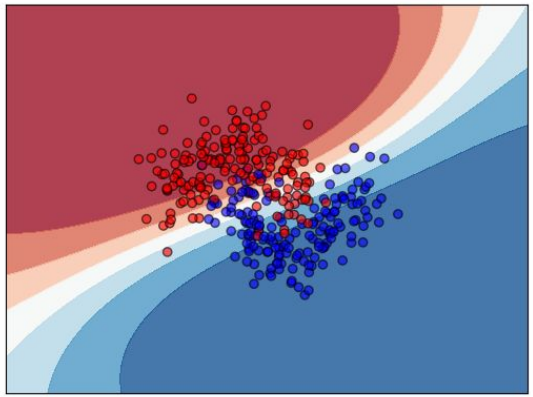


SVM – Hyperparameters

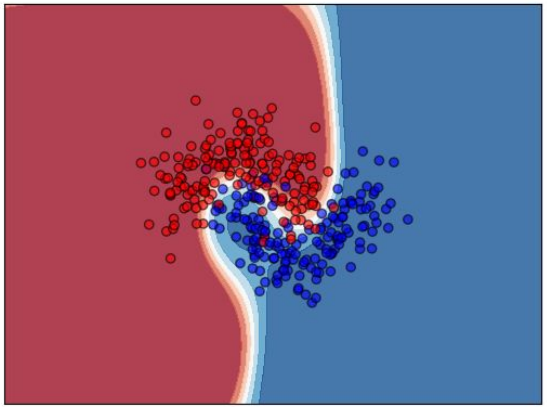
- Need of feature scaling.
- Hyperparameters:
  - C: Controls the number misclassifications we “accept”.
    - Larger C, more overfitting (allows less misclassifications).
    - Lower C, more underfitting (allows more misclassifications).
  - gamma: Controls the curvature of our boundary. Mora gamma, more curvature.
  - kernel: ‘linear’, ‘poly’, ‘rbf’

SVM – C

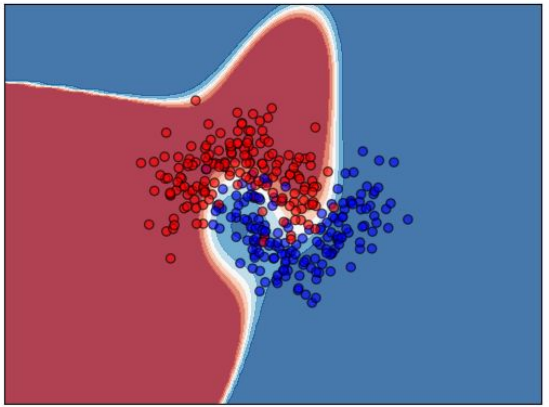
C = 1



C = 1,000

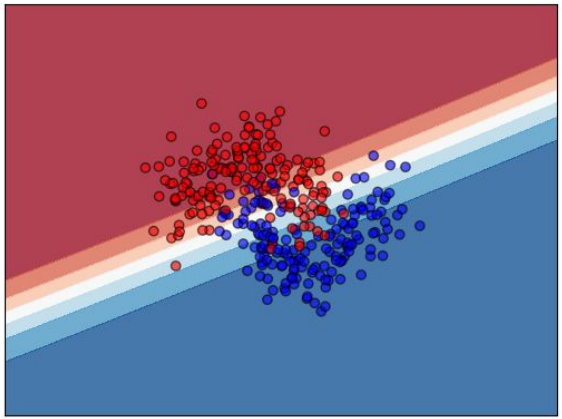


C = 100,000

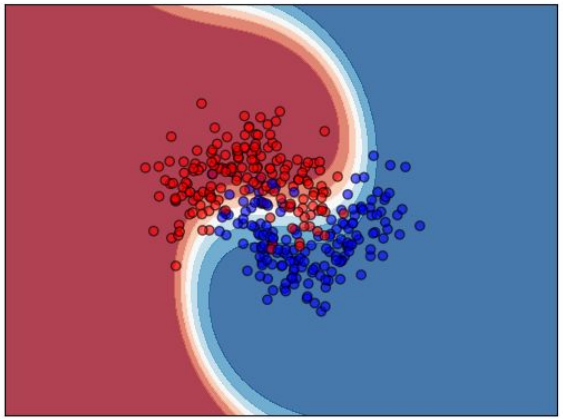


SVM – gamma

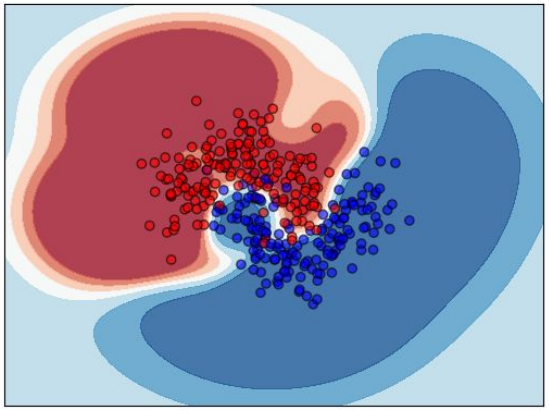
gamma = 0.01



gamma = 0.5



gamma = 10



SVM – sklearn

```
from sklearn.svm import SVC
```