

## The problem

How can you determine the best possible boundary line?

It depends a lot on the data and the problem that we're approaching, which means that we need some flexibility. That flexibility is going to be provided by the C parameter.

The C parameter is just a constant that attaches itself to the classification error by multiplying the classification error by the constant.

The **C** parameter - also referred to as the **C** hyper-parameter - determines how flexible we are willing to be with the points that fall on the wrong side of our dividing boundary. The value of **C** ranges between 0 and infinity. When **C** is large, you are forcing your boundary to have fewer errors than when it is a small value.

**Note: when C is too large for a particular set of data, you might not get convergence at all because your data cannot be separated with the small number of errors allotted with such a large value of C.**

- If we have a very *large* C, then the error is mostly the classification error, so we're focusing more on correctly classifying our points than on finding a good margin.
- If the C is very *small*, then the error is mostly a margin error, so we're focusing mostly on a large margin than on classifying the points correctly.

## Quiz Question

What is true about the C parameter? ( There may be more than one correct answer )

- a. It is used to modify the classification error
- b. It is a hyperparameter that provides some flexibility during training
- c. A large value for C will usually result in a small margin
- d. A small value for C will usually result in a large margin