CS544: MP2

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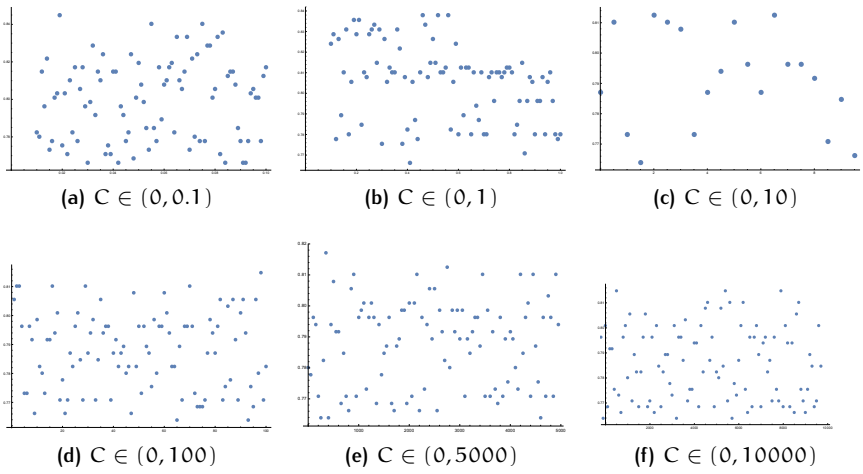

(a) $C \in (0, 0.1)$ **(b)** $C \in (0, 1)$ **(c)** $C \in (0, 10)$

(d) $C \in (0, 100)$ **(e)** $C \in (0, 5000)$ **(f)** $C \in (0, 10000)$

Figure 1: This shows the effects of modifying the C value on accuracy for the MONK dataset. As can be seen, the accuracy follows an almost uniform distribution.

The short answer is no. Taking 169 training examples from the MONK dataset — which contains 2 classes and 6 features — and performing a linear SVM while varying the C value we get the accuracies shown in Figure 1. As can be seen, the accuracies are almost uniformly distributed — achieving between $0.7 - 0.85$ accuracy for almost all C values. So, while the entire regularization path can be computed, it is seldom useful in practice. One can use grid search which is both easier to implement and can be parametrized more carefully – parameterizing for compute complexity versus accuracy.

The liblinear package, for example, advocate the use of grid search because (1) it is easier to implement and (2) we are more satisfied if we "think" we have done an exhaustive search. They take large multiples of C, $C \in [10, 10^2, 10^4, \ldots]$, because the algorithm's behaves similar at C vs $C + \epsilon$.