Each mini will be worth 10 marks, maybe as a replacement for lab assignments. A PDF report should be submitted along with IPYNB. They may be considered emailed to the instructor directly ([y@cai.iitkgp.ac.in](mailto:adway@cai.iitkgp.ac.in)). There is no deadline for these projects. However, no student will be graded for more than 2 of these mini projects. The list of project topics will be updated as the classes proceed.

1. Try out different variants to K-NN classification as discussed in class today (e.g. High K, low K, inverse distance-based weighting, hybrid voting (number vs sum of inverse distance weights) etc.) and list out pros and cons of each approach. Try different synthetic or toy datasets with varying D (number of attributes) and K (number of class labels).
2. Try out different kinds of regularized functions on regression problems, either of synthetic datasets or standard/public datasets. Explore the impacts of changing the “lambda” parameter on the structure of “w” and on the least-square error. In addition to ridge and LASSO, you may try out I) elastic net regularization, ii) mixed-norm or group-sparsity regularization.
3. Try out different kinds of SVM Kernel Functions on non-linearly separable datasets. You may create your own datasets that are non-linearly separable, I.e., can be separated by a non-linear structure, and see which all Kernels can he suitable to classify them.