Project 1

Advanced Machine Learning

January 2019

1 Instruction

Create your submission on a jupyter notebook or google collab.

1.1 Implement Ridge and Lasso regression

Start from your implementation of the linear regression on the TP in lecture 1 implement Ridge and Lasso regression.

You have to add the regularization term to the cost function and the gradient descent.

Be careful, for the gradient descent w_0 is exclude from the regularization.

1.2 Classification

It's time to apply your knowledge on real data. Go on kaggle website, download Titanic data from competition.

1.2.1 Prepare the data for the machine learning model

1.2.2 Establish a simple model as baseline model that you aim to exceed (here you can use the model female==survive)

1.2.3 Train logistic regression, SVC, random forest and gradient boosting tree on the training data

1.2.4 Make predictions on the test data

1.2.5 Compare predictions to the known test set targets and calculate performance metrics

1.2.6 Tune models hyperparameters

1.2.7 Submit your best prediction on kaggle and note your ranking on the jupyter notebook

1.2.8 Make a conclusion

You can help you with kernels on kagggle, but don't forget to argue all your choices and comment your code.

1.3 Regression

It's time to apply your knowledge on real data. Go on kaggle website, download House Prices data from competition.

1.3.1 Prepare the data for the machine learning model

1.3.2 Establish a simple model as baseline model that you aim to exceed (here you can use the mean of the true prediction from the training set)

1.3.3 Train linear regression, SVR, random forest and gradient boosting tree on the training data

1.3.4 Make predictions on the test data

1.3.5 Compare predictions to the known test set targets and calculate performance metrics

1.3.6 Tune models hyperparameters

1.3.7 Submit your best prediction on kaggle and note your ranking on the jupyter notebook

1.3.8 Make a conclusion

You can help you with kernels on kagggle, but don't forget to argue all your choices and comment your code.