

Solar Energy Production Forecasting

Train data; 2021 January to 2021 November (11 months of data)

Test data; 2021 November to 2022 January (1 months of data)

Used features; Temperature, Cloud cover, global_rad:W, diffuse_rad:W, direct_rad:W, relative_humidity_2m:p, wind_speed_10m:ms, prob_precip_1h:p, t_apparent:C, sun_elevation:d and encoded time data

Summary: In this report , Calculated **Mean Squared Errors** of 8 different machine learning model and 1 neural network model based on 11 month of test and 1 month of test data.

Process

Firstly, data are read by excel file and stored in pandas data frame then analyzed correlation between features and removed useless features.

Secondly formatted time data converted numerical values using encoding methods then data normalized

Finally, data split into train and test by %80 and %20 percent ration then calculated test and train errors for different models then visualized error results.

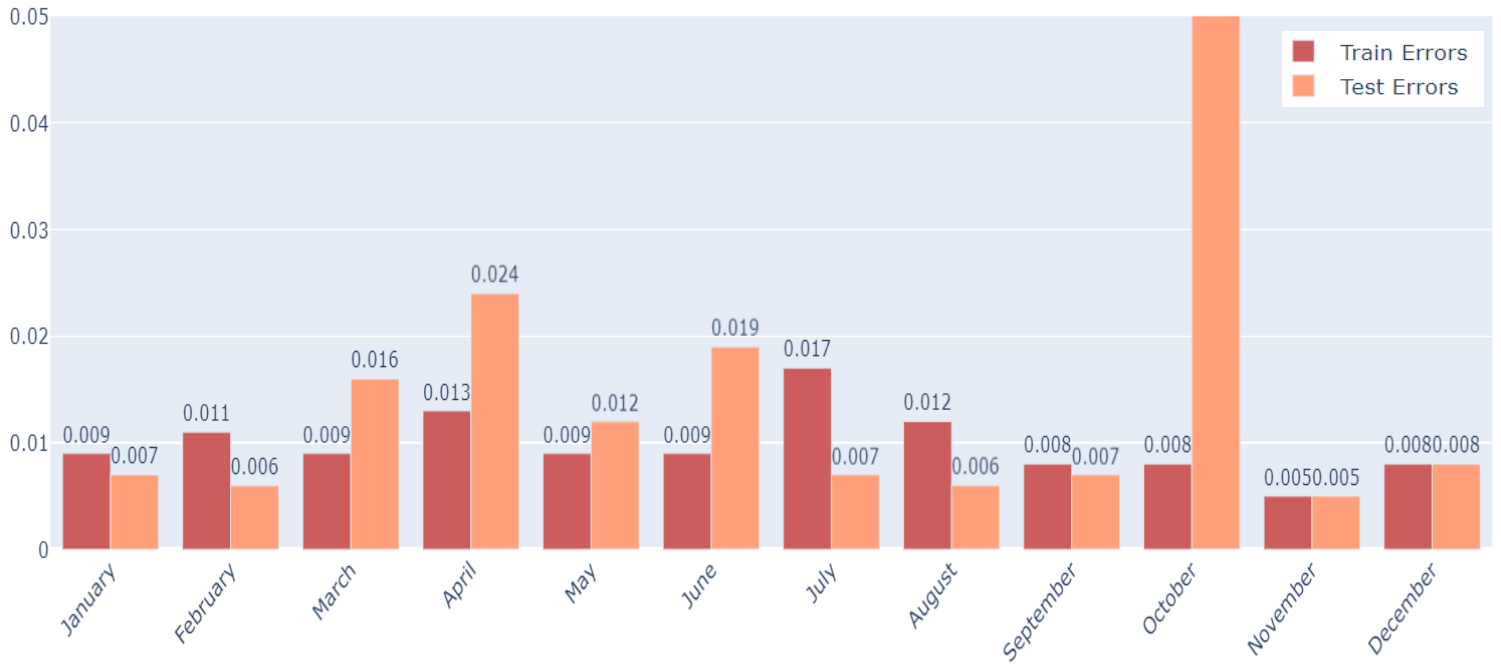
Train Errors General

	months	ridge	lasso	decisiontree	kneighbors	linear	randomforest	xgb	adaboost	neuralnetwork
0	January	0.009	0.042	0.0	0.002	0.009	0.001	0.0	0.004	0.009
1	February	0.011	0.060	0.0	0.004	0.011	0.001	0.0	0.006	0.016
2	March	0.010	0.067	0.0	0.004	0.009	0.001	0.0	0.006	0.009
3	April	0.015	0.096	0.0	0.007	0.013	0.001	0.0	0.011	0.014
4	May	0.009	0.136	0.0	0.003	0.009	0.001	0.0	0.006	0.007
5	June	0.010	0.139	0.0	0.003	0.009	0.001	0.0	0.004	0.011
6	July	0.017	0.119	0.0	0.003	0.017	0.001	0.0	0.013	0.015
7	August	0.012	0.117	0.0	0.003	0.012	0.001	0.0	0.007	0.008
8	September	0.009	0.124	0.0	0.001	0.008	0.001	0.0	0.003	0.006
9	October	0.008	0.112	0.0	0.002	0.008	0.000	0.0	0.002	0.009
10	November	0.007	0.072	0.0	0.002	0.005	0.000	0.0	0.002	0.007
11	December	0.009	0.050	0.0	0.004	0.008	0.001	0.0	0.006	0.009

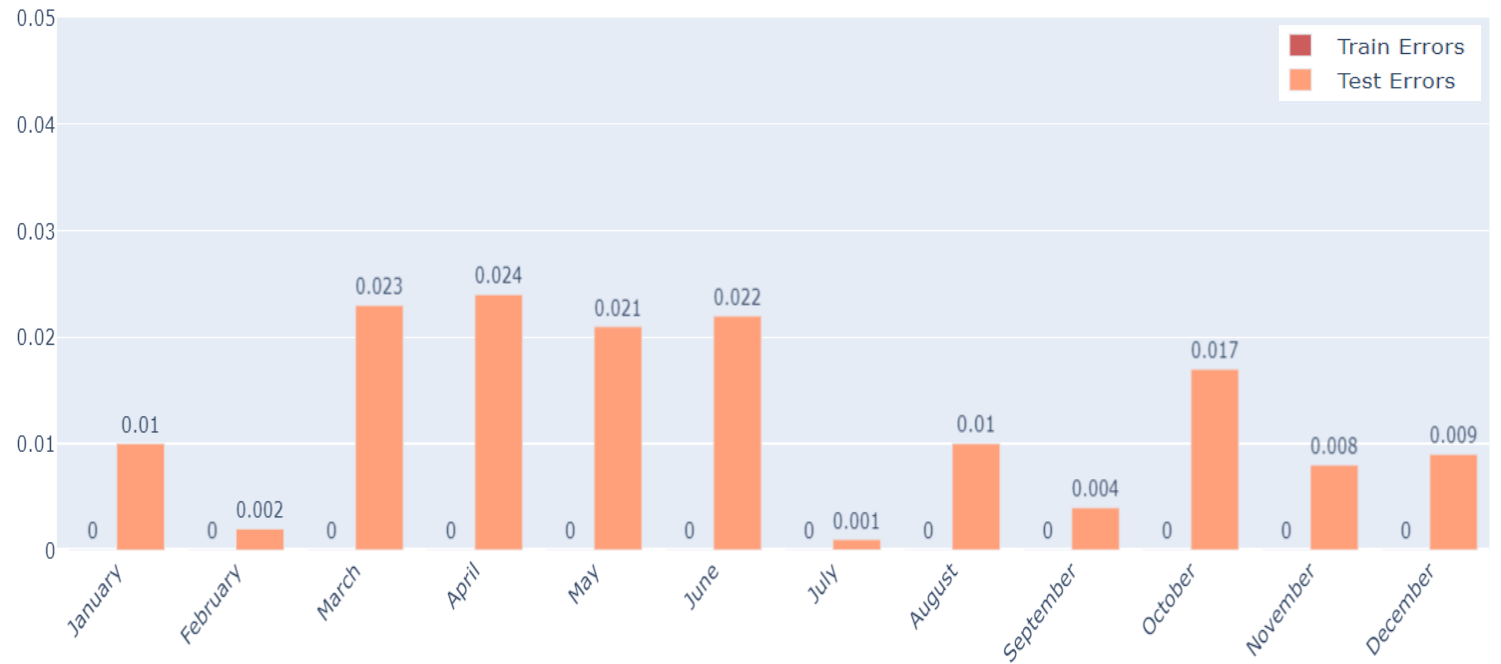
Test Errors General

	months	ridge	lasso	decisiontree	kneighbors	linear	randomforest	xgb	adaboost	neuralnetwork
0	January	0.007	0.030	0.010	0.020	0.007	0.006	0.008	0.006	0.007
1	February	0.006	0.106	0.002	0.002	0.006	0.001	0.002	0.006	0.016
2	March	0.016	0.117	0.023	0.106	0.016	0.015	0.017	0.019	0.025
3	April	0.022	0.110	0.024	0.032	0.024	0.016	0.018	0.025	0.028
4	May	0.012	0.126	0.021	0.015	0.012	0.011	0.014	0.012	0.030
5	June	0.020	0.118	0.022	0.016	0.019	0.017	0.016	0.026	0.031
6	July	0.007	0.133	0.001	0.003	0.007	0.001	0.001	0.017	0.015
7	August	0.006	0.122	0.010	0.003	0.006	0.001	0.003	0.006	0.007
8	September	0.008	0.130	0.004	0.003	0.007	0.001	0.001	0.004	0.015
9	October	0.017	0.069	0.017	0.015	0.059	0.012	0.012	0.013	0.015
10	November	0.004	0.033	0.008	0.026	0.005	0.005	0.004	0.005	0.011
11	December	0.007	0.056	0.009	0.007	0.008	0.004	0.004	0.007	0.012

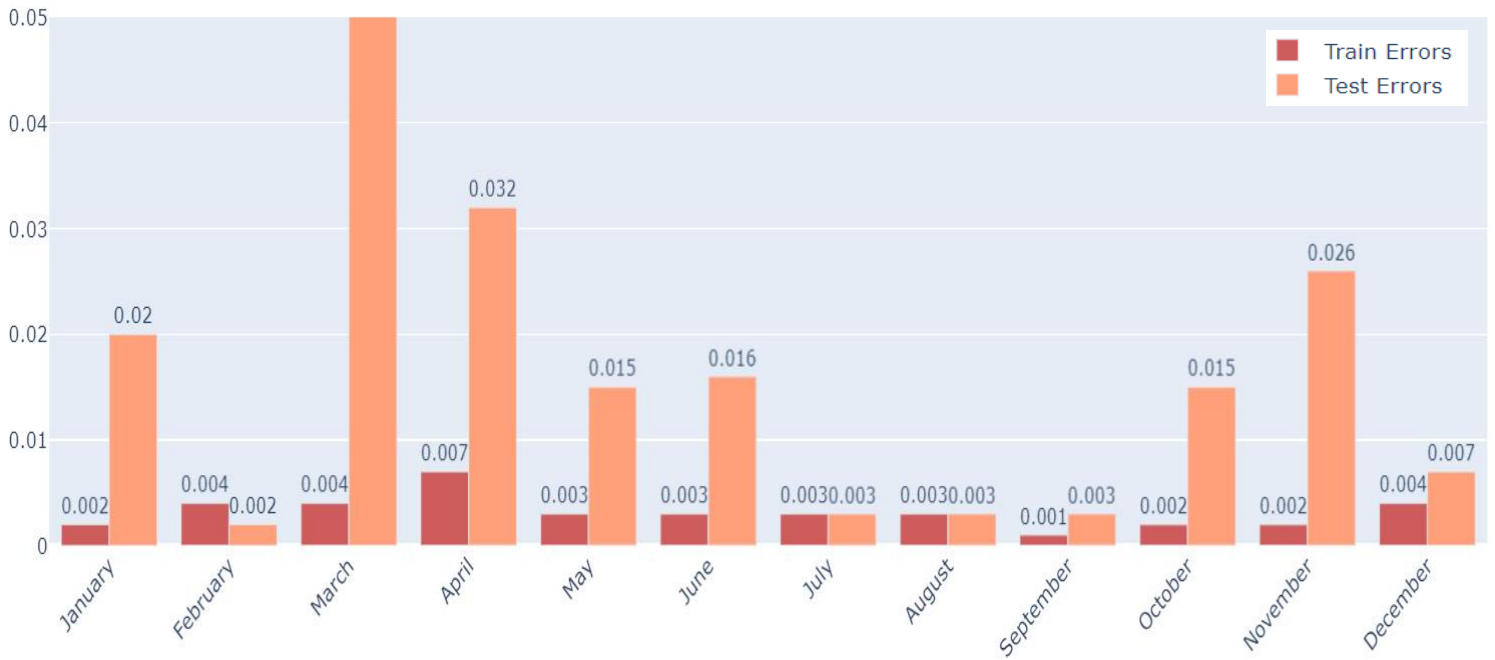
Linear Model Errors



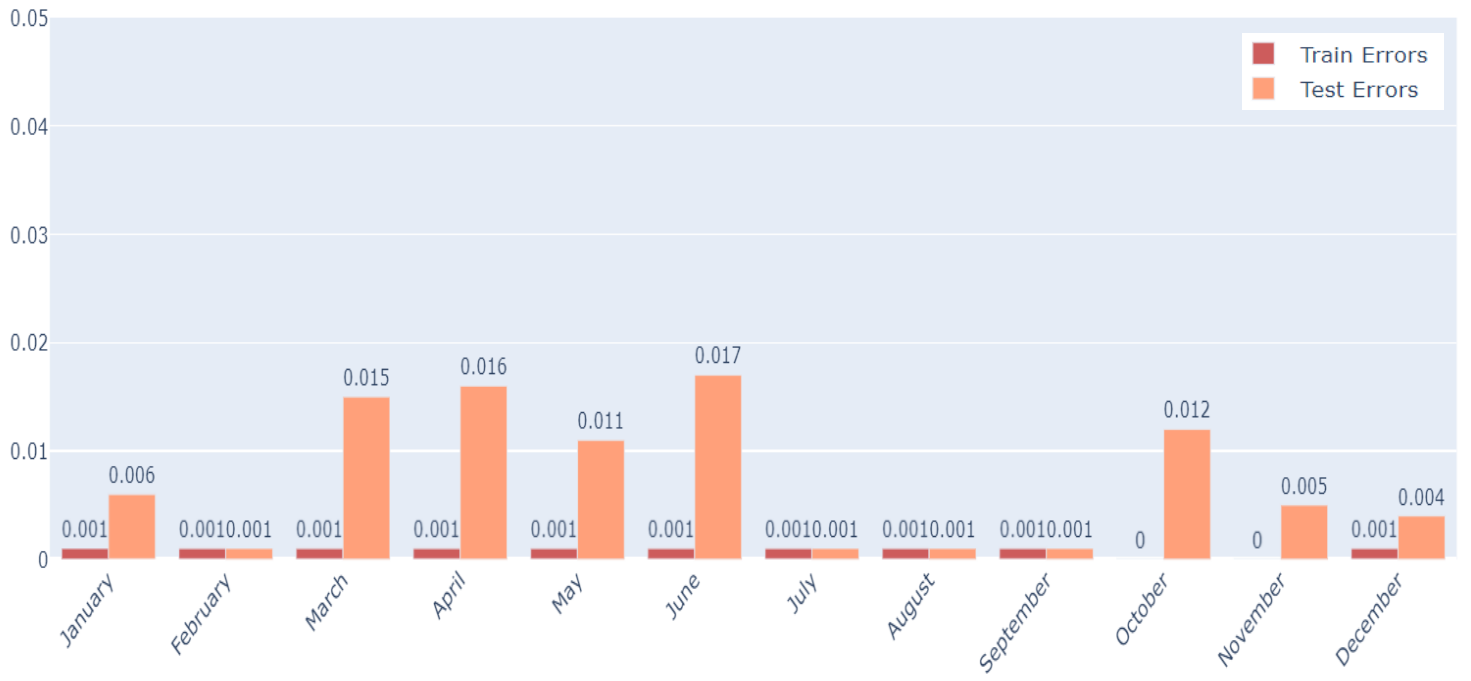
Decision Tree Model Errors



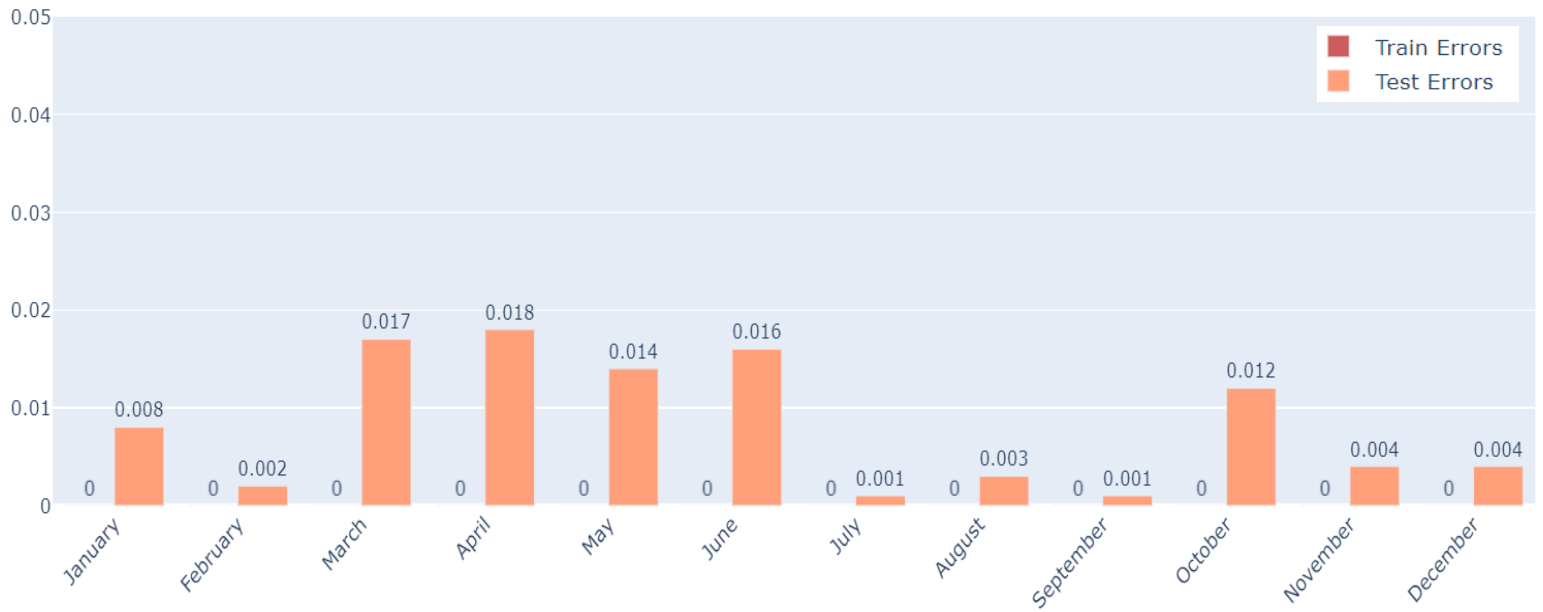
KNeighborsRegressor Model Errors



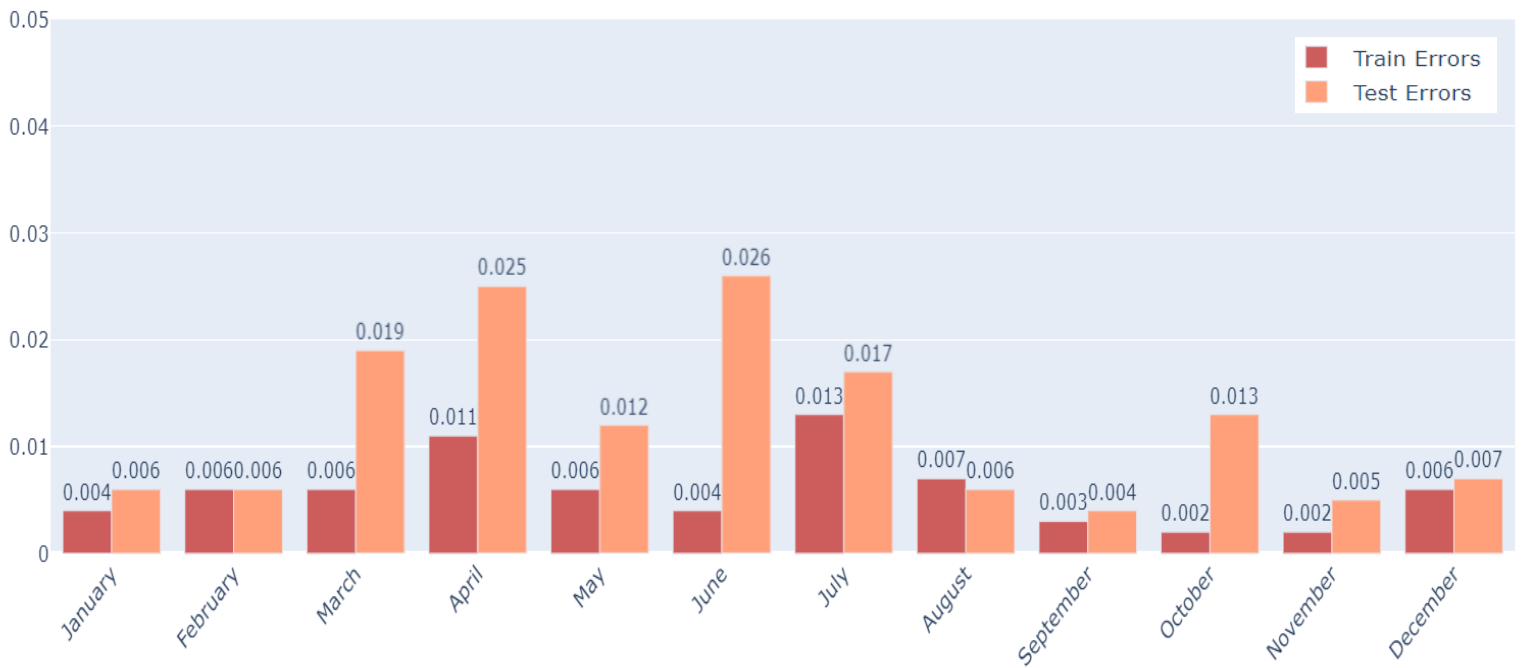
Random Forest Model Errors



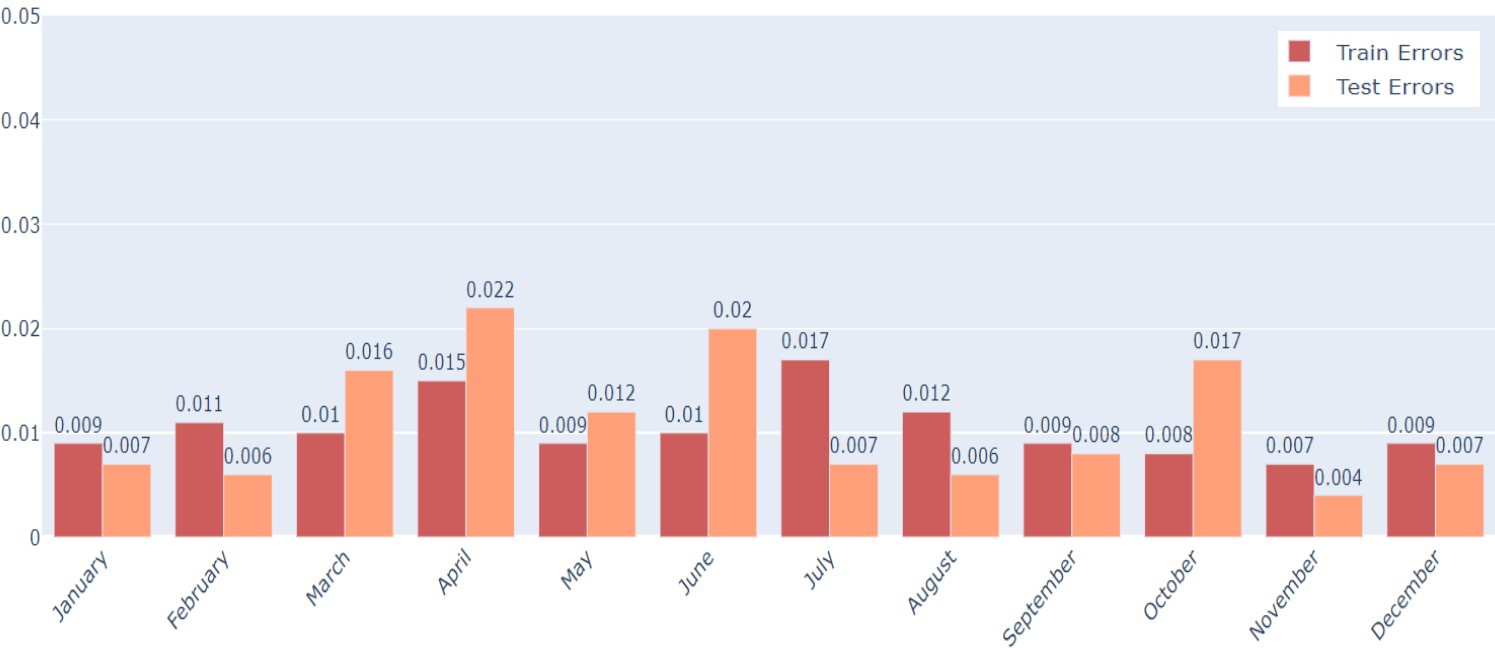
XgBoost Model Errors



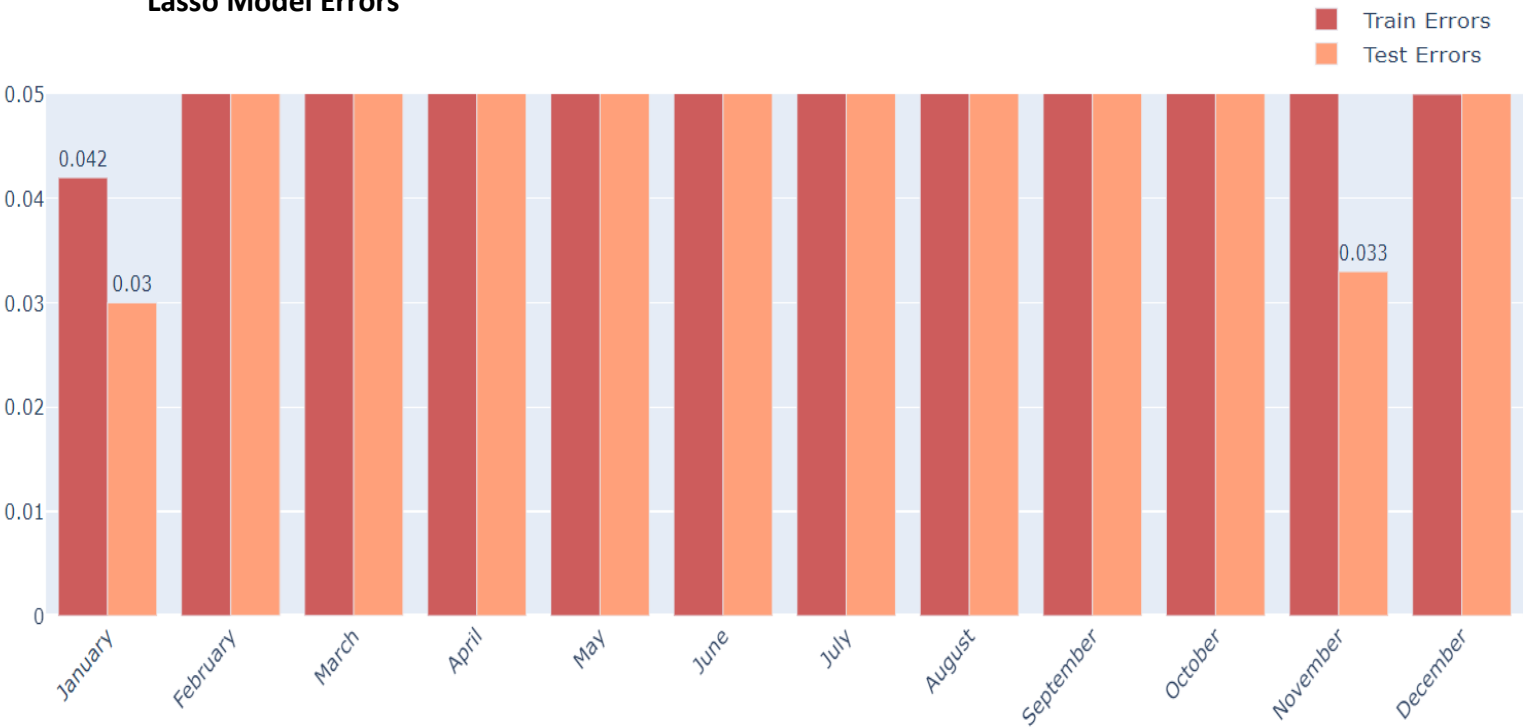
AdaBoost Model Errors



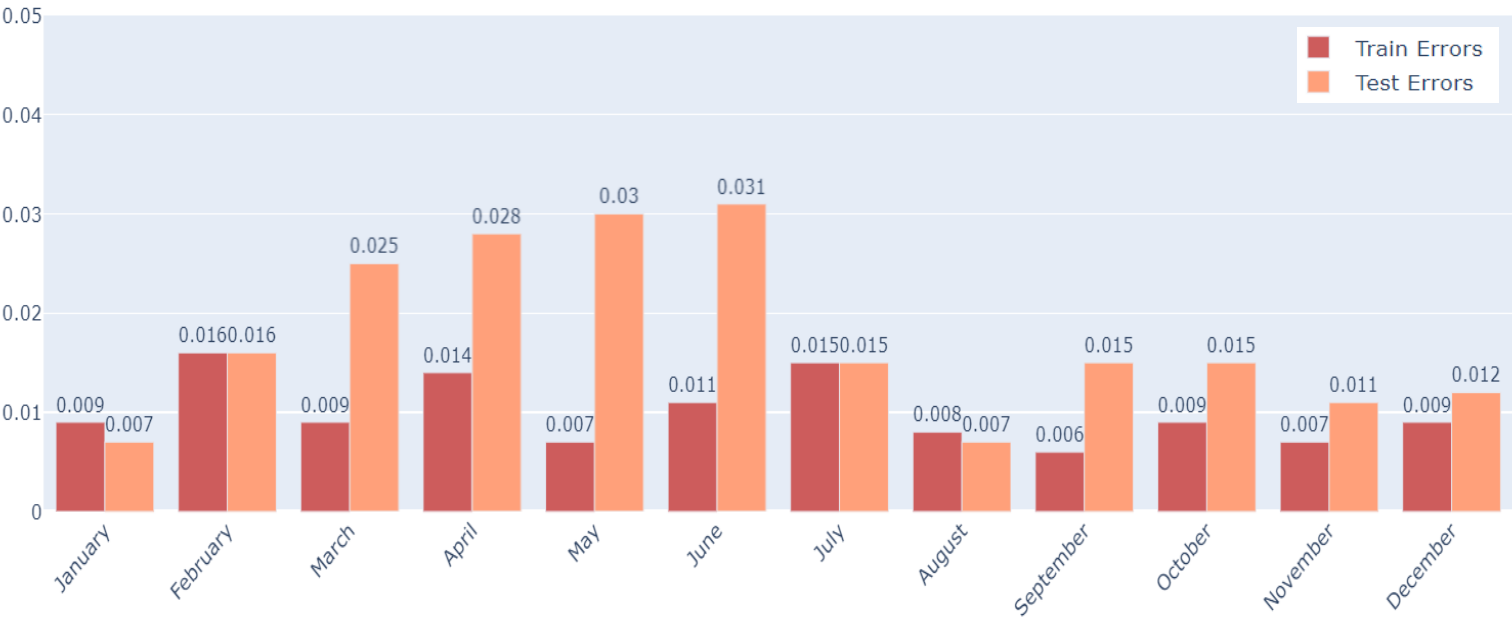
Ridge Model Errors



Lasso Model Errors



Neural Network Model Errors



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