MAADSBML AutoML Report For ALBERTA-ELECTRIC-SYSTEM-OPERATOR_AESO Generated On: 2024-04-17 02:26:34 (UTC)

Best Model(s) Report For admin_aesopowerdemandlogistic_csv

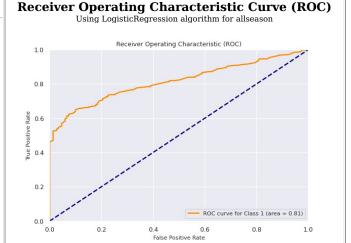
MODEL DESCRIPTION

Model Trained On: 2024/04/17 Training Start Time: 0223 Training End Time: 0226 Was Data Normalized: Yes Was Data Normanzed: Was Data Shuffled: No Deep Analysis: No Total Training Data Set: 897 Training Data Percentage: 70% Total Test Data Set: 383 Total # of Variables: 4 Adjusted for Seasonality: N Total Algorithms Run: 600 Removed Outliers: N ROC AUC: 0.814

Precision: 0.980 (0.417 For Class=0) Recall: 0.546 (0.967 For Class=0) F1-Score: 0.701 (0.583 For Class=0)

Best Distribution FOR ACTUAL Y: RECIPINVGAUS Dependent Variable: AESO POWER DEMAND LABEL

Independent Variables: ['Calgary_Weather', 'Edmonton_Weather', 'FtMac_Weather']



IMPORTANT FILE PATHS FOR RAW AND OUTPUT DATA

NOTE: These are DOCKER CONTAINER Paths. You can view these files inside the container by using the command: docker exec -it {container id} bash If you have re-run the container, these files will be GONE but they exist on your HOST machine. The HOST MACHINE location is based on the volumes you mapped when you ran the Docker container. The Docker RUN Volume Mappings are :: (For example here is the docker run command (use multiple -v for multiple mappings):

DOCKER RUN COMMAND: docker run -d -p 5595:5595 -p 5495:5495 -p 10000:10000 -v {HOST MACHINE FOLDER}:{CONTAINER FOLDER}:z --env TRAININGPORT=5595 --env PREDICTIONPORT=5495 --env ABORTPORT=10000 --env COMPANYNAME=MYCOMPANY --env MAXRUNTIME=20 --env MAINHOST=127.0.0.1 maadsdocker/maads-batchautoml-otics

Docker Volume Mappings:

- 1. {HOST MACHINE FOLDER}/csvuploads:/maads/agentfilesdocker/dist/maadsweb/csvuploads:z 2. {HOST MACHINE FOLDER}/pdfreports:/maads/agentfilesdocker/dist/maadsweb/pdfreports:z

- 2. (HOST MACHINE FOLDER)/purreports:/maads/agentiflesdocker/dist/maadsweb/purreports:/ 3. (HOST MACHINE FOLDER)/autofeatures:/maads/agentfilesdocker/dist/maadsweb/autofeatures:2 4. (HOST MACHINE FOLDER)/sqlloads:/maads/agentfilesdocker/dist/maadsweb/sqlloads:z 6. (HOST MACHINE FOLDER)/networktemp:/maads/agentfilesdocker/dist/maadsweb/networktemp:z 7. (HOST MACHINE FOLDER)/networks:/maads/agentfilesdocker/dist/maadsweb/networktemp:z
- {HOST MACHINE FOLDER}/exception:/maads/agentfilesdocker/dist/maadsweb/exception:z
- 8. {HOST MACHINE FOLDER}/exception:/maads/agentiilesuocker/uist/maads/ 9. {HOST MACHINE FOLDER}/staging:/maads/agentfilesdocker/dist/staging:2

Path for Training Dataset File: /maads/agentfilesdocker/dist/maadsweb/csvuploads/aesopowerdemandlogistic.csv
Path for PDF Report (i.e. this file): /maads/agentfilesdocker/dist/maadsweb/pdfreports/admin_aesopowerdemandlogistic_csv_no_seasons.pdf
Path for AutoFeature File: /maads/agentfilesdocker/dist/maadsweb/autofeatures/admin_aesopowerdemandlogistic_csv_csv
Path for Outliers File: /maads/agentfilesdocker/dist/maadsweb/outliers/admin_aesopowerdemandlogistic_csv_csv
Path for Algo JSON File: /maads/agentfilesdocker/dist/maadsweb/exception/admin_aesopowerdemandlogistic_csv_trained_algo_no_seasons.json

Folder Path for MySQL Scripts: /maads/agentfilesdocker/dist/maadsweb/sqlloads/ Path for Detailed Prediction File: /maads/agentfilesdocker/dist/maadsweb/csvuplo

Path for Detailed Prediction File: //maads/agentfilesdocker/dist/maadsweb/csvuploads/admin_aesopowerdemandlogistic_csv_prediction_details.csv
Path for Algorithm Zip File (i.e pickle files): //maads/agentfilesdocker/dist/maadsweb/networktemp/admin_aesopowerdemandlogistic_csv.zip

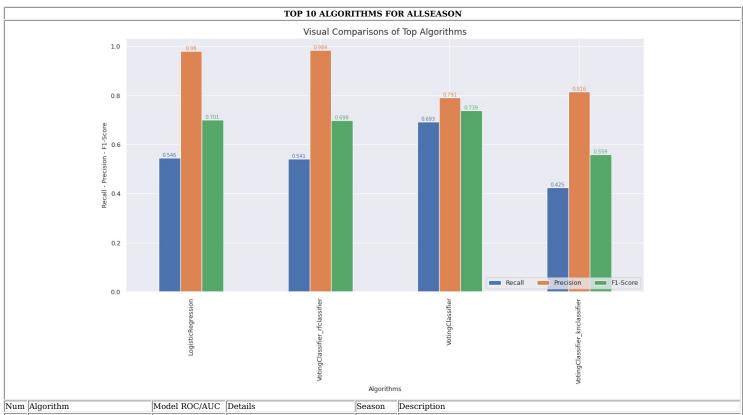
Path for Algorithm Pickle Files:

1. /maads/agentfilesdocker/networks/Alberta-Electric-SystemOperator_AESO)_ADMIN_AESOPOWERBEMANDLOGISTIC_CSVALLSEASON_AG1_4_LogisticRegression_normal_897_ensembleone_pkl

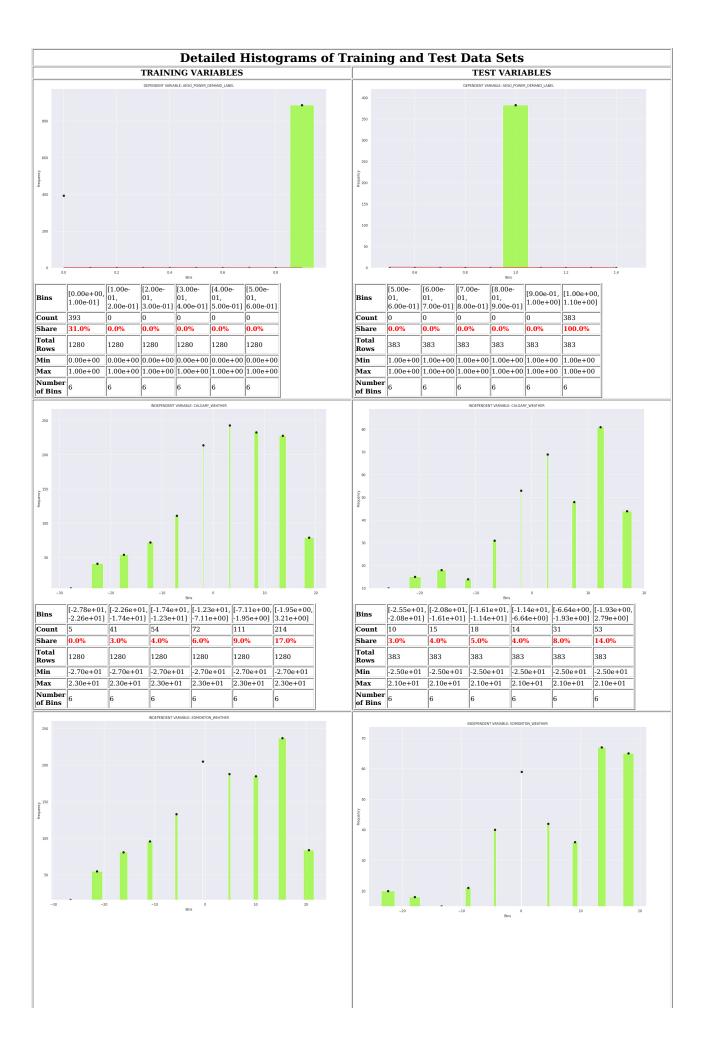
2. /maads/agentfilesdocker/networks/Alberta-Electric-SystemOperator_AESO)_ADMIN_AESOPOWERDEMANDLOGISTIC_CSVALLSEASON_AG1_4_LogisticRegression_normal_897_ensembleone_scalerx_pkl

DESCRIPTIVE STATISTICS T-Statistic Count Mean MIN Variables STD 25% 50% 75% MAX Calgary_Weather -3 505 897.0 5 129 -27 75 10.061 -0.9 6.05 12.8 23 85 Edmonton Weather -3.116 897.0 4.998 -26.64 -3.0 6.25 14.65 25.75 11.629 3562660013702567.5 FtMac Weather 897.0 1.239 -32.4 13.472 -8.95 2.9 12.9 23.85 AESO POWER DEMAND LABEL NA 897.0 0.562 0.0 0.496 0.0 1.0 1.0 1.0

BEST ALGORITHM FOUND FOR THIS DATASET (Note: This trained model will be used to predict AESO_POWER_DEMAND_LABEL)								
Algorithm	Description	Model Results	ROC/AUC	Precision	Recall	F1- Score	Forecast Months	Season
LogisticRegression	Logistic Regression:	LogisticRegression(C=0.1860459960309015, class_weight='balanced', intercept_scaling=3.1075182003565724, random_state=22)	0.588	0.980: Class=1 (0.417:	0.546: Class=1 (0.967:	0.701: Class=1 (0.583:	1 - 12	allseason
		Coefficient: [[-0.2177191188668427, -0.3748682196080884, -0.5694693332793505]]				(0.363: Class=0)		

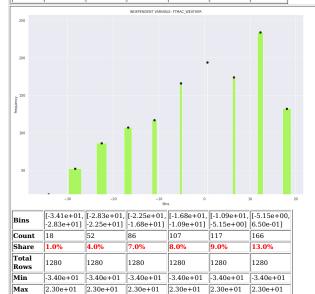


Num	Algorithm	Model ROC/AUC	Details	Season	Description
1	<u>LogisticRegression</u>	0.5880	Recall: 0.546 (class 1) Precision: 0.98 (class 1) F1 Score: 0.701 (class 1) Recall: 0.967 (class 0) Precision: 0.417 (class 0) F1 Score: 0.583 (class 0) False Positive Rate: 0.8% True Negaive Rate: 0.8% False Negative Rate: 34.0% True Positive Rate: 40.8%	allseason	LOGISTIC REGRESSION:
2	VotingClassifier_rfclassifier	0.5330	Recall: 0.541 (class 1) Precision: 0.984 (class 1) F1 Score: 0.698 (class 1) Recall: 0.974 (class 0) Precision: 0.416 (class 0) F1 Score: 0.583 (class 0) False Positive Rate: 0.7% True Negaive Rate: 0.7% False Negative Rate: 34.3% True Positive Rate: 40.5%	allseason	RANDOM FOREST CLASSIFIER: Random forest
3	<u>VotingClassifier</u>	0.5000	Recall: 0.693 (class 1) Precision: 0.791 (class 1) F1 Score: 0.739 (class 1) Recall: 0.457 (class 0) Precision: 0.333 (class 0) F1 Score: 0.385 (class 0) False Positive Rate: 13.7% True Negalive Rate: 13.7% False Negative Rate: 23.0% True Positive Rate: 51.8%	allseason	VOTING CLASSIFIER: Combination of different classifers (DecisionTree, RandomForest,K nearest neighbour,GaussNB,Extra tree,ADA boost, etc)
4	VotingClassifier_knclassifier	0.4490	Recall: 0.425 (class 1) Precision: 0.816 (class 1) F1 Score: 0.559 (class 1) Recall: 0.715 (class 0) Precision: 0.295 (class 0) F1 Score: 0.418 (class 0) False Positive Rate: 7.2% True Negaive Rate: 7.2% True Positive Rate: 31.8% False Negative Rate: 43.0%	allseason	K-NEAREST NEIGHBOUR: k-nearest neighbour

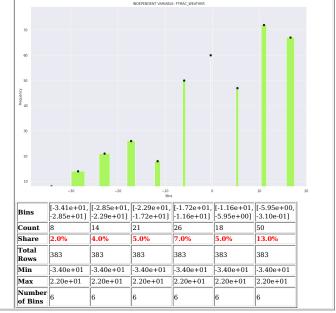


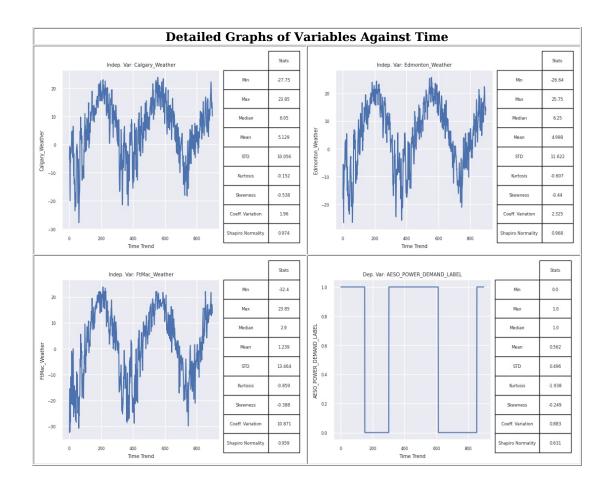
Bins	[-2.66e+01, -2.14e+01]	[-2.14e+01, -1.62e+01]	[-1.62e+01, -1.09e+01]	[-1.09e+01, -5.68e+00]	[-5.68e+00,	[-4.45e- 01, 4.79e+00]
Count	16	55	81	96	133	205
Share	1.0%	4.0%	6.0%	8.0%	10.0%	16.0%
Total Rows	1280	1280	1280	1280	1280	1280
Min	-2.60e+01	-2.60e+01	-2.60e+01	-2.60e+01	-2.60e+01	-2.60e+01
Max	2.50e+01	2.50e+01	2.50e+01	2.50e+01	2.50e+01	2.50e+01
Number of Bins	6	6	6	6	6	6

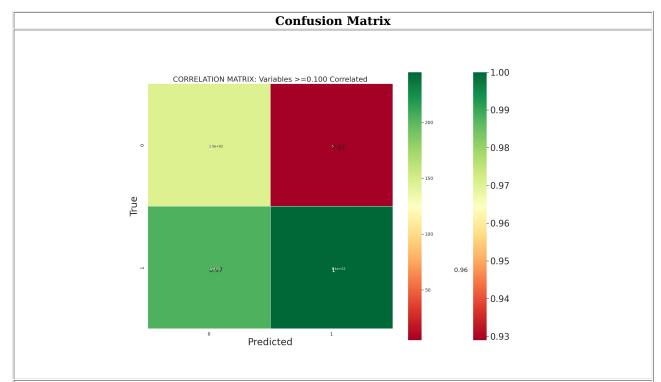
				[-8.91e+00,		
Dilis	-1.79e+01]	-1.34e+01]	-8.91e+00]	-4.42e+00]	7.50e-02]	4.57e+00]
Count	20	18	15	21	40	59
Share	5.0%	5.0%	4.0%	5.0%	10.0%	15.0%
Total Rows	383	383	383	383	383	383
Min	-2.20e+01	-2.20e+01	-2.20e+01	-2.20e+01	-2.20e+01	-2.20e+01
Max	2.20e+01	2.20e+01	2.20e+01	2.20e+01	2.20e+01	2.20e+01
Number of Bins	6	6	6	6	6	6



Number of Bins







The confusion matrix shows the True Negatives (top left)/True Positives (bottom right) on the diagonals, and False Negatives (top right) and False Positives (bottom left).

True Positives: 5 False Positives: 146 True Negatives: 204 False Negatives: 204 Total Population: 600

The False Positve Rate(FPR) is: 0.83% The False Negative Rate is: 34.0% The True Positive Rate is: 40.83% The True Negative Rate is: 24.33%

The Positive Likelihood Ratio (True Positive Rate/False Positive Rate)is: 49.19 The Negative Likelihood Ratio (False Negative Rate/True Negative Rate) is: 1.4

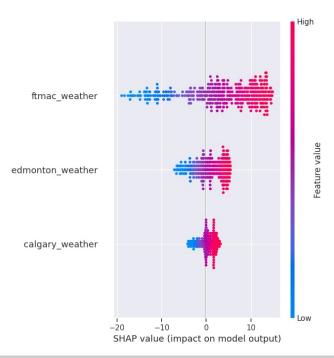
Accuracy: 0.588 Precision: 0.98 Recall: 0.546 F1 Score: 0.701

Precision Curve: [0.748, 0.750, 0.749, 0.750, 0.752, 0.753, 0.752, 0.752, 0.756, 0.756, 0.756, 0.756, 0.758, 0.760, 0.762, 0.764, 0.764, 0.767, 0.769, 0.770, 0.776, 0.776, 0.775, 0.776

Recall Curve: [1.000, 1.000, 0.998, 0.998, 0.998, 0.998, 0.991, 0.987, 0.984, 0.982, 0.976, 0.971, 0.971, 0.969, 0.969, 0.967, 0.960, 0.955, 0.947, 0.947, 0.942, 0.935, 0.931, 0.924, 0.915, 0.913, 0.909, 0.909, 0.904, 0.898, 0.895, 0.889, 0.889, 0.882, 0.880, 0.873, 0.871, 0.866, 0.860, 0.857, 0.851, 0.844, 0.840, 0.831, 0.824, 0.820, 0.820, 0.820, 0.815, 0.811, 0.806, 0.804, 0.800, 0.795, 0.793, 0.791, 0.788, 0.784, 0.784, 0.777, 0.773, 0.766, 0.766, 0.762, 0.762, 0.759, 0.753, 0.748, 0.744, 0.739, 0.737, 0.737, 0.733, 0.726, 0.722, 0.715, 0.710, 0.706, 0.702, 0.688, 0.682, 0.682, 0.673, 0.668, 0.666, 0.664, 0.661, 0.657, 0.657, 0.653, 0.648, 0.646, 0.644, 0.639, 0.633, 0.630, 0.626, 0.621, 0.615, 0.612, 0.612, 0.612, 0.610, 0.608, 0.601, 0.597, 0.595, 0.586, 0.584, 0.577, 0.568, 0.541, 0.434, 0.432, 0.423, 0.419, 0.416, 0.414, 0.412, 0.410, 0.408, 0.401, 0.394, 0.392, 0.388, 0.385, 0.381, 0.376, 0.372, 0.367, 0.363, 0.359, 0.354, 0.347, 0.343, 0.339, 0.334, 0.330, 0.318, 0.314, 0.312, 0.305, 0.301, 0.298, 0.296, 0.294, 0.285, 0.281, 0.269, 0.265, 0.258, 0.252, 0.249, 0.247, 0.245, 0.241, 0.238, 0.232, 0.229, 0.218, 0.214, 0.207, 0.200, 0.196, 0.194, 0.192, 0.187, 0.185, 0.183, 0.176, 0.174, 0.165, 0.160, 0.154, 0.147, 0.143, 0.138, 0.136, 0.131, 0.127, 0.122, 0.116, 0.114, 0.111, 0.107, 0.102, 0.100, 0.098, 0.096, 0.091, 0.089, 0.007, 0.004, 0.000]

Thresholds: [0.381, 0.383, 0.386, 0.387, 0.388, 0.389, 0.390, 0.392, 0.393, 0.394, 0.395, 0.396, 0.397, 0.398, 0.399, 0.400, 0.401, 0.402, 0.403, 0.404, 0.405, 0.406, 0.407, 0.408, 0.409, 0.410, 0.411, 0.412, 0.413, 0.414, 0.415, 0.416, 0.417, 0.418, 0.419, 0.420, 0.421, 0.422, 0.423, 0.424, 0.425, 0.426, 0.427, 0.428, 0.429, 0.430, 0.431, 0.432, 0.433, 0.434, 0.435, 0.436, 0.437, 0.438, 0.439, 0.440, 0.441, 0.442, 0.443, 0.444, 0.445, 0.446, 0.447, 0.448, 0.449, 0.455, 0.456, 0.457, 0.458, 0.459, 0.450, 0.451, 0.452, 0.453, 0.454, 0.455, 0.456, 0.457, 0.458, 0.459, 0.460, 0.461, 0.462, 0.463, 0.464, 0.465, 0.466, 0.467, 0.468, 0.469, 0.470, 0.471, 0.472, 0.473, 0.474, 0.475, 0.476, 0.477, 0.478, 0.479, 0.480, 0.481, 0.482, 0.483, 0.484, 0.485, 0.486, 0.487, 0.488, 0.489, 0.490, 0.491, 0.492, 0.493, 0.494, 0.495, 0.496, 0.497, 0.498, 0.499, 0.500, 0.501, 0.502, 0.503, 0.504, 0.507, 0.508, 0.509, 0.510, 0.512, 0.513, 0.514, 0.515, 0.516, 0.517, 0.519, 0.520, 0.520, 0.524, 0.525, 0.526, 0.528, 0.529, 0.530, 0.532, 0.534, 0.535, 0.566, 0.567, 0.588, 0.539, 0.540, 0.541, 0.542, 0.543, 0.545, 0.546, 0.549, 0.550, 0.551, 0.552, 0.553, 0.554, 0.556, 0.557, 0.558, 0.559, 0.560, 0.563, 0.564, 0.565, 0.566, 0.567, 0.568, 0.569, 0.570, 0.571, 0.572, 0.574, 0.575, 0.576, 0.577, 0.578, 0.607, 0.608, 0.609, 0.611, 0.612, 0.613, 0.614, 0.616, 0.618, 0.619, 0.602, 0.621, 0.622, 0.624, 0.626, 0.627, 0.628, 0.629, 0.631, 0.663, 0.633, 0.634, 0.635, 0.664, 0.664, 0.644, 0.645, 0.644, 0.645, 0.647, 0.649, 0.650, 0.651, 0.652, 0.653, 0.654, 0.666, 0.664, 0.664, 0.664, 0.664, 0.665, 0.667, 0.665, 0.666, 0.666, 0.664, 0.664, 0.664, 0.664, 0.665, 0.667, 0.660, 0.665, 0.666, 0.664, 0.664, 0.664, 0.665, 0.667, 0.665, 0.665, 0.666, 0.664, 0.664, 0.664, 0.665, 0.667, 0.665, 0.665, 0.6668]

MODEL EXPLANATION



- The x-axis represents the model's output values of AESO_POWER_DEMAND_LABEL

 The plot is centered on the x-axis at explainer.expected value.

 All values are relative to the model's expected value like a linear model's effects are relative to the intercept.

 The y-axis lists the model's features. By default, the features are ordered by descending importance.

 The importance is calculated over the observations plotted. This is usually different than the importance ordering for the entire dataset.

 In addition to feature importance ordering, the decision plot also supports hierarchical cluster feature ordering and user-defined feature ordering.
- Each observation's prediction is represented by a colored line.
 At the top of the plot, each line strikes the x-axis at its corresponding observation's predicted value. This value determines the color of the line on a
- Moving from the bottom of the plot to the top, SHAP values for each feature are added to the model's base value.
 This shows how each feature contributes to the overall prediction.
 At the bottom of the plot, the observations converge at explainer.expected_value.
 The points in the graph are the values of the feature in the training dataset.

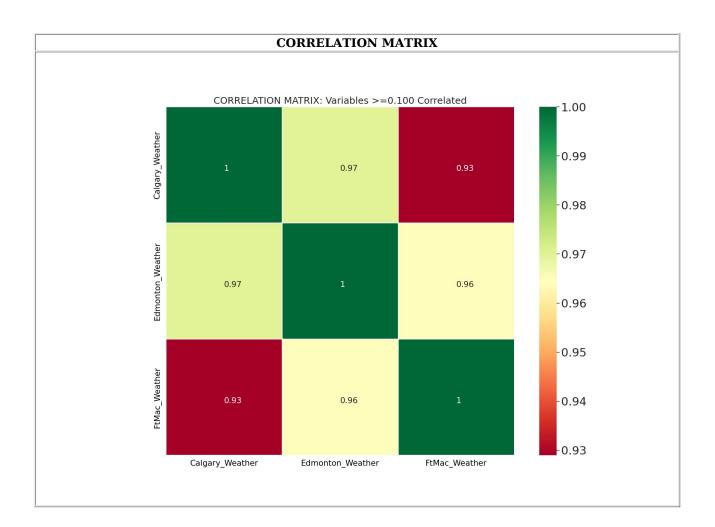
FEATURE SELECTION					
RFE Variable (Most important to Least Important)					
AESO_POWER_DEMAND_LABEL	0.982				
AESO_Power_Demand	0.304				
FtMac_Weather	0.009				
Edmonton_Weather	0.006				
Calgary_Weather	0.004				
Best Variable(s) From Genetic Algorithm					
AESO_POWER_DEMAND_LABEL					
Calgary_Weather					
FtMac_Weather					
Excluded Variable(s)					
FtMac_Weather					
Edmonton_Weather					
PCA for Best Variable(s)	Value				
AESO_POWER_DEMAND_LABEL_pca_1	0.707				
AESO_POWER_DEMAND_LABEL_pca_2	-0.707				
AESO_Power_Demand_pca_1	0.707				
AESO_Power_Demand_pca_2	0.707				
AESO_Power_Demand_pca_3	-0.081				
Calgary_Weather_pca_1	-0.707				
Calgary_Weather_pca_2	-0.707				
Calgary_Weather_pca_3	0.672				
FtMac_Weather_pca_1	-0.707				
FtMac_Weather_pca_2	0.707				
FtMac_Weather_pca_3	-0.736				
PCA Explained Variance	Value				
PCA1	0.551				
PCA2	0.449				
PCA3	0.023				

- Feature selection shows which variables were more influential than other variables

 It uses two core algorithms: Recursive Feature Elimination (RFE) and Genetic Algorithm to determine influence

 It also performs PCA (principal component analysis) analysis to determine the influence of the best variables in the model

 These results should be used in conjunction with other information as well as theory to establish relevance and confidence in the chosen model formulation



CORRELATED FEATURES					
Feature(s)	Feature(s) Feature(s) Correlation >= 0.100				
O Calgary_Weather	FtMac_Weather	0.929			
1 Edmonton_Weather	FtMac_Weather	0.964			
2 Calgary_Weather	Edmonton_Weather	0.970			
3 Calgary_Weather	Calgary_Weather	NaN			

SUGGESTED CORRELATED FEATURES TO DELETE						
	2 Feature(s) to Delete	Correlation				
	O Calgary_Weather	0.929				
	1 Edmonton_Weather	0.964				

END OF REPORT

MAADSBML Python Library: https://pypi.org/project/maadsbml/
MAADSBML Docker Container For Windows: https://hub.docker.com/r/maadsdocker/maads-batch-automl-otics
MAADSBML Docker Container For MAC: https://hub.docker.com/r/maadsdocker/maads-batch-automl-otics-arm64
MAADSBML Sample Code and Setup: https://github.com/smaurice101/raspberrypi/tree/main/maadsbml

MAADSBML
Developed and Maintained by: Otics Advanced Analytics, Inc.
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