# Sarit\_GoldPrice

## Assistance

Routine Description importFiles Import file(s) into H<sub>2</sub>O importSqlTable Import SQL table into H<sub>2</sub>O Get a list of frames in H<sub>2</sub>O  $\blacksquare$ getFrames X Split a frame into two or more frames splitFrame Merge two frames into one mergeFrames Get a list of models in H<sub>2</sub>O getModels Get a list of grid search results in H<sub>2</sub>O getGrids getPredictions Get a list of predictions in H2O Get a list of jobs running in H<sub>2</sub>O getJobs ♣ runAutoML Automatically train and tune many models buildModel Build a model Import a saved model importModel predict Make a prediction

# Import Files

# 1 / 1 files imported.

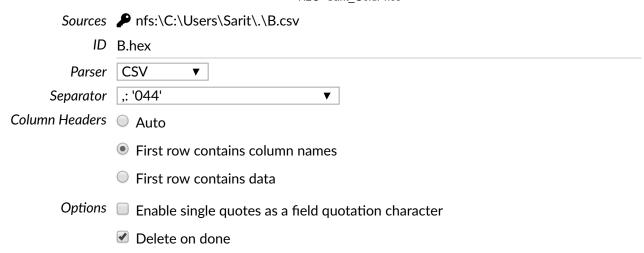
Files C:\Users\Sarit\.\B.csv

Actions Parse these files...

# Setup Parse

PARSE CONFIGURATION

127.0.0.1:54321/flow/index.html# 1/16



#### EDIT COLUMN NAMES AND TYPES

Search	hy co	lumn	name

1	GoldPrice	Numeric ▼	282.7	281.1	281.4			
2	ma_20	Numeric ▼	0.0	0.0	0.0			
3	ma_100	Numeric ▼	0.0	0.0	0.0			
4	std_20	Numeric ▼	0.0	0.0	0.0			
5	std_100	Numeric ▼	0.0	0.0	0.0			
6	rsi	Numeric ▼	0.0	0.0	0.0			
7	Rolling Mea	Numeric ▼	0.0	0.0	0.0			
8	Bollinger H	Numeric ▼	0.0	0.0	0.0			
9	Bollinger L	Numeric ▼	0.0	0.0	0.0			
10	26_ema	Numeric ▼	282.7	281.86923076923074	281.7006407			
11	12_ema	Numeric ▼	282.7	281.8333333333333	281.6642032			
12	macd	Numeric ▼	0.0	-0.03589743589736827	-0.03643747			
13	CCI	Numeric ▼	2396.2335080366793	2396.2335080366793	2396.233508			
14	Index	Numeric ▼	1411.75	1413.5	1404.0			
15	CrudeOilPri	Numeric ▼	25.55	24.91	24.78			
<b>(</b>	← Previous page → Next page							

Parse

## **₹** Job

Run Time 00:00:00.208

Remaining Time 00:00:00.0

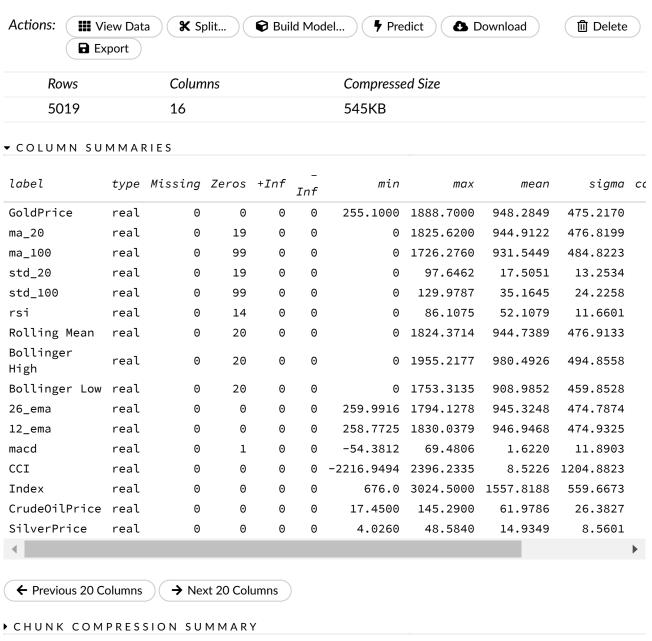
Type Frame

Key Q B.hex

127.0.0.1:54321/flow/index.html# 2/16

Description Parse
Status DONE
Progress 100%
Done.
Actions Q View

## **B.**hex



# **X** Split Frame

▶ FRAME DISTRIBUTION SUMMARY

Frame: B.hex ▼

127.0.0.1:54321/flow/index.html# 3/16

 Splits:
 Ratio
 Key

 0.75
 frame\_0.750
 X

 0.250
 frame\_0.250

 Add a new split
 672235

**X** Create

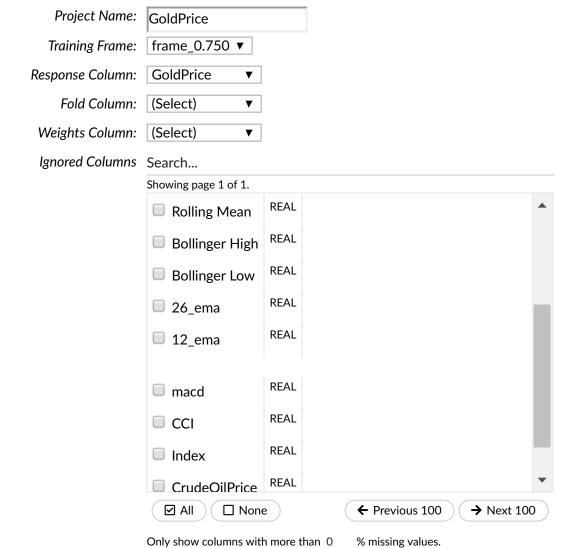
# **⊞** Split Frames

 Type
 Key
 Ratio

 ■ frame\_0.750
 0.75

 ■ frame\_0.250
 0.25

# Run AutoML



127.0.0.1:54321/flow/index.html# 4/16

Validation Frame:	frame_0.250 ▼
Blending Frame:	(Select) ▼
Leaderboard Frame:	(Select) ▼
Balance classes:	
Exclude these algorithms	<b>☑</b> GLM
	✓ DRF
	□ GBM
	✓ XGBoost
	<ul><li>DeepLearning</li></ul>
	StackedEnsemble
Max models to build:	
Max Run Time (sec):	3600
Max Run Time Per Model (sec):	0
Early stopping metric:	AUTO ▼
Leaderboard sort metric:	AUTO ▼
Early stopping rounds:	3
Early stopping tolerance:	
nfolds:	5
Keep cross-validation predictions	
Keep cross-validation models	
Keep cross-validation fold assignment	
Seed:	-1
Checkpoints path:	

Build Model

# **≨**∃Job

Run Time 00:27:41.40
Remaining Time 00:00:00.0

Type Auto Model

Key Q GoldPrice

127.0.0.1:54321/flow/index.html# 5/16

Description AutoML build

Status DONE

Progress 100%

Done.

Actions Q View

## **₹** Leaderboard



### **▼** MODELS

mod	lels sorted in order of mean residual deviance, best first		
TR	GBM_gr1a_1_AutoML_20190830_180354_modet_22	(1.00055419940662	8.42618
19	GBM_grid_1_AutoML_20190830_180354_model_13	76.24788188928936	8.73200
20	GBM_grid_1_AutoML_20190830_180354_model_14	76.41769080161889	8.74172
21	GBM_grid_1_AutoML_20190830_180354_model_24	78.98520285708946	8.88736
22	GBM_grid_1_AutoML_20190830_180354_model_18	85.54088844629977	9.24883
23	GBM_grid_1_AutoML_20190830_180354_model_16	85.92915406009816	9.26979
24	GBM_grid_1_AutoML_20190830_180354_model_20	93.03117764596328	9.64526
25	GBM_grid_1_AutoML_20190830_180354_model_12	104.30460084655859	10.2129
26	DeepLearning_grid_1_AutoML_20190830_184925_model_1	109.25818337936789	10.4526
27	GBM_grid_1_AutoML_20190830_180354_model_19	111.54532276896718	10.5615
28	GBM_grid_1_AutoML_20190830_180354_model_21	113.2425357207691	10.6415
29	GBM_grid_1_AutoML_20190830_180354_model_39	150.85642634895314	12.2823
30	GBM_grid_1_AutoML_20190830_180354_model_10	155.08882571338404	12.4534
31	DeepLearning_grid_1_AutoML_20190830_180354_model_5	179.69168554706732	13.4049
32	DeepLearning_grid_1_AutoML_20190830_180354_model_11	280.01032474246216	16.7335
33	StackedEnsemble_BestOfFamily_AutoML_20190830_180354	281.69446253130593	16.7837
34	DeepLearning_grid_1_AutoML_20190830_180354_model_12	541.0155166894643	23.2597
35	DeepLearning_1_AutoML_20190830_180354	832.9438638540176	28.8607
36	GBM_grid_1_AutoML_20190830_180354_model_3	985.706850898955	31.3959
37	DeepLearning_grid_1_AutoML_20190830_180354_model_2	3189.6866141919018	56.4773
38	DeepLearning_grid_1_AutoML_20190830_180354_model_3	3823.666376304304	61.8358
39	DeepLearning_1_AutoML_20190830_184925	4609.639235913511	67.8943
40	DeepLearning_grid_1_AutoML_20190830_184925_model_4	5445.408704742914	73.7930 🔻
4			<b>)</b>

### ▼ EVENT LOG

### Actions taken and discoveries made by AutoML

	timestamp	level	stage	message
0	18:49:25.855	Info	Workflow	Project: GoldPrice
1	18:49:25.856	Info	Workflow	AutoML job created: 2019.08.30 18:49:25.855
2	18:49:25.856	Info	ModelTraining	Disabling Algo: GLM as requested by the user.

127.0.0.1:54321/flow/index.html# 6/16

				_
	timestamp	level	stage	message
3	18:49:25.856	Info	ModelTraining	Disabling Algo: XGBoost as requested by the user.
4	18:49:25.856	Info	ModelTraining	Disabling Algo: DRF as requested by the user.
5	18:49:25.856	Info	Workflow	Build control seed: -1 (random)
6	18:49:25.857	Info	DataImport	training frame: Frame key: automl_training_frame_cols: 16 rows: 3744 chunks: 32 size: 425594 check-8402911879973505744
7	18:49:25.857	Info	DataImport	validation frame: Frame key: frame_0.250 cols: 10 1275 chunks: 32 size: 169431 checksum: 2836949813690275393
8	18:49:25.857	Info	DataImport	leaderboard frame: NULL
9	18:49:25.857	Info	DataImport	response column: GoldPrice
10	18:49:25.857	Info	DataImport	fold column: null
11	18:49:25.857	Info	DataImport	weights column: null
12	18:49:25.870	Info	Workflow	Setting stopping tolerance adaptively based on the training frame: 0.016343011261515335
13	18:49:25.965	Info	Workflow	AutoML build started: 2019.08.30 18:49:25.965
14	18:49:26.13	Debug	ModelTraining	GBM 1 started
				GBM 1 failed: water.exceptions.H2OModelBuilderIllegalArgumentE> ▼
4				111 1 ±/\£ CDU .11.

# **♥** Model

Model ID: GBM\_grid\_1\_AutoML\_20190830\_180354\_model\_1

Algorithm: Gradient Boosting Machine

Actions: Refresh Predict... Download POJO

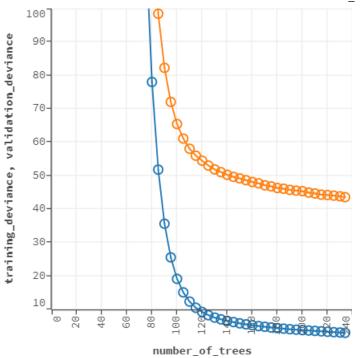
Download Model Deployment Package (MOJO)
 ☐ Export
 ☐ Inspect
 ☐ Delete

▲ Download Gen Model

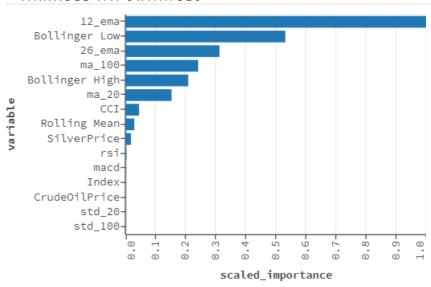
▶ MODEL PARAMETERS

▼ SCORING HISTORY - DEVIANCE

127.0.0.1:54321/flow/index.html# 7/16



#### ▼ VARIABLE IMPORTANCES



### ▶ OUTPUT

- ▶ COLUMN\_TYPES
- ▶ CROSS\_VALIDATION\_MODELS
- ▶ CROSS\_VALIDATION\_PREDICTIONS
- ▶ OUTPUT MODEL SUMMARY
- ▶ OUTPUT SCORING HISTORY
- ▼ OUTPUT TRAINING\_METRICS

```
model GBM_grid_1_AutoML_20190830_180354_model_1
model_checksum -2362825141229477580
frame automl_training_frame_0.750
frame_checksum -8402911879973505744
description ·
model_category Regression
scoring_time 1567159466901
predictions ·
MSE 3.015304
RMSE 1.736463
nobs 3744
custom_metric_name ·
custom_metric_value 0
r2 0.999987
```

#### ▼ OUTPUT - VALIDATION\_METRICS

mean\_residual\_deviance 3.015304

mae 1.013495
rmsle 0.001692

```
model GBM_grid_1_AutoML_20190830_180354_model_1
        model_checksum -2362825141229477580
                 frame frame_0.250
        frame_checksum 2836949813690275393
           description ·
        model_category Regression
          scoring_time 1567159466902
           predictions ·
                  MSE 43.581250
                 RMSE 6.601610
                 nobs 1275
   custom_metric_name .
   custom_metric_value 0
                   r2 0.999806
mean_residual_deviance 43.581250
                  mae 3.213230
                 rmsle 0.005704
```

### ▼ OUTPUT - CROSS\_VALIDATION\_METRICS

127.0.0.1:54321/flow/index.html# 9/16

model GBM\_grid\_1\_AutoML\_20190830\_180354\_model\_1

model\_checksum -2362825141229477580

frame automl\_training\_frame\_0.750

frame\_checksum -8402911879973505744

description 5-fold cross-validation on training data (Metrics computed for

combined holdout predictions)

model\_category Regression

scoring\_time 1567159466908

predictions ·

MSE 31.930171

RMSE 5.650679

nobs 3744

custom\_metric\_name •

custom\_metric\_value 0

r2 0.999859

mean\_residual\_deviance 31.930171

mae 2.972439

rmsle 0.005208

#### ▼ OUTPUT - CROSS-VALIDATION METRICS SUMMARY

	mean	sd	cv_1_valid	cv_2_valid	cv_3_valid	cv_4_
mae	2.9724364	0.25551504	3.0907815	3.2776253	2.5807467	2.950
mean_residual_deviance	31.928343	12.623731	39.88798	49.357876	17.583118	27.73
mse	31.928343	12.623731	39.88798	49.357876	17.583118	27.73
r2	0.9998588	5.5986162E- 5	0.9998234	0.9997815	0.9999224	0.999
residual_deviance	31.928343	12.623731	39.88798	49.357876	17.583118	27.73
rmse	5.5617223	1.1155633	6.3156934	7.025516	4.193223	5.266
rmsle	0.0051814364	5.862415E-4	0.005474817	0.0059846663	0.0045035384	0.005

#### ▶ OUTPUT - VARIABLE IMPORTANCES

### ▼ PREVIEW POJO

Preview POJO

## **₩** Model

Model ID: DeepLearning\_grid\_1\_AutoML\_20190830\_184925\_model\_1

Algorithm: Deep Learning

Actions: Refresh Predict... Download POJO

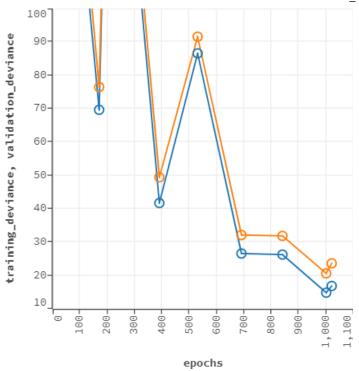
 Language (MOJO)
 <td

▲ Download Gen Model

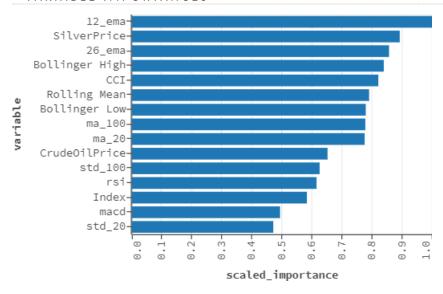
#### ▶ MODEL PARAMETERS

### ▼ SCORING HISTORY - DEVIANCE

127.0.0.1:54321/flow/index.html# 10/16



#### ▼ VARIABLE IMPORTANCES



#### ▶ OUTPUT

- ▶ COLUMN\_TYPES
- ▶ CROSS\_VALIDATION\_MODELS
- ▶ CROSS\_VALIDATION\_PREDICTIONS
- ▶ OUTPUT STATUS OF NEURON LAYERS (PREDICTING GOLDPRICE, REGRESSION, GAUSSIAN DISTRIBUTION, QUADRATIC LOSS, 3,401 WEIGHTS/BIASES, 47.6 KB, 3,818,880 TRAINING SAMPLES, MINI-BATCH SIZE 1)
- ▶ OUTPUT SCORING HISTORY
- ▼ OUTPUT TRAINING\_METRICS

8/30/2019

```
model DeepLearning_grid_1_AutoML_20190830_184925_model_1
       model_checksum -2276087880993571200
                 frame automl_training_frame_0.750
        frame_checksum -8402911879973505744
           description Metrics reported on full training frame
       model_category Regression
          scoring_time 1567162905408
          predictions ·
                  MSE 16.872492
                  RMSE 4.107614
                 nobs 3744
    custom_metric_name .
   custom_metric_value 0
                   r2 0.999925
mean_residual_deviance 16.872492
                  mae 2.812520
```

#### ▼ OUTPUT - VALIDATION\_METRICS

rmsle 0.003912

```
model DeepLearning_grid_1_AutoML_20190830_184925_model_1
       model checksum -2276087880993571200
                 frame frame_0.250
       frame_checksum 2836949813690275393
           description Metrics reported on full validation frame
       model_category Regression
          scoring_time 1567162905931
           predictions ·
                  MSE 23.646710
                 RMSE 4.862788
                 nobs 1275
    custom_metric_name .
   custom_metric_value 0
                   r2 0.999895
mean_residual_deviance 23.646710
                  mae 3.202286
                 rmsle 0.004531
```

#### ▼ OUTPUT - CROSS\_VALIDATION\_METRICS

127.0.0.1:54321/flow/index.html# 12/16

model DeepLearning\_grid\_1\_AutoML\_20190830\_184925\_model\_1

model\_checksum -2276087880993571200

frame automl\_training\_frame\_0.750

frame\_checksum -8402911879973505744

description 5-fold cross-validation on training data (Metrics computed for

combined holdout predictions)

model\_category Regression

scoring\_time 1567162905933

predictions ·

MSE 109.258183

RMSE 10.452664

nobs 3744

custom\_metric\_name •

custom\_metric\_value 0

r2 0.999517

mean\_residual\_deviance 109.258183

mae 7.306537

rmsle 0.014787

#### ▼ OUTPUT - CROSS-VALIDATION METRICS SUMMARY

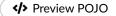
	mean	sd	cv_1_valid	cv_2_valid	cv_3_valid	cv_4_vc
mae	7.3051724	4.3066335	5.25462	6.314338	9.180928	13.5802
mean_residual_deviance	109.23219	107.83843	50.300903	66.34603	131.63982	285.957
mse	109.23219	107.83843	50.300903	66.34603	131.63982	285.957
r2	0.9995171	4.7666425E-4	0.9997773	0.9997063	0.99941885	0.99873
residual_deviance	109.23219	107.83843	50.300903	66.34603	131.63982	285.957
rmse	9.414673	5.073969	7.092313	8.145308	11.473439	16.9102
rmsle	0.01309405	0.0076763877	0.008303158	0.0148319965	0.015311046	0.02362

### ▼ OUTPUT - VARIABLE IMPORTANCES

127.0.0.1:54321/flow/index.html#

variable	relative_importance	scaled_importance	percentage
12_ema	1.0	1.0	0.0913
SilverPrice	0.8908	0.8908	0.0813
26_ema	0.8551	0.8551	0.0781
Bollinger High	0.8378	0.8378	0.0765
CCI	0.8196	0.8196	0.0748
Rolling Mean	0.7888	0.7888	0.0720
Bollinger Low	0.7778	0.7778	0.0710
ma_100	0.7763	0.7763	0.0709
ma_20	0.7739	0.7739	0.0706
CrudeOilPrice	0.6506	0.6506	0.0594
std_100	0.6243	0.6243	0.0570
rsi	0.6142	0.6142	0.0561
Index	0.5822	0.5822	0.0531
macd	0.4929	0.4929	0.0450
std_20	0.4703	0.4703	0.0429

#### ▼ PREVIEW POJO



cs Model

Model ID: StackedEnsemble\_BestOfFamily\_AutoML\_20190830\_180354

Algorithm: Stacked Ensemble

- ► MODEL PARAMETERS
- ▶ OUTPUT
- NAMES
- ▶ COLUMN\_TYPES
- ▶ DOMAINS
- ▼ OUTPUT TRAINING\_METRICS

```
model StackedEnsemble_BestOfFamily_AutoML_20190830_180354
             model_checksum 1410290972738960780
                      frame automl_training_frame_0.750
             frame_checksum -8402911879973505744
                description ·
             model_category Regression
               scoring_time 1567162413515
                predictions ·
                        MSE 172.835648
                       RMSE 13.146697
                       nobs 3744
         custom_metric_name .
        custom_metric_value 0
                         r2 0.999236
     mean_residual_deviance 172.835648
                        mae 12.199254
                      rmsle 0.024759
          residual_deviance 647096.666397
              null_deviance 846761149.591961
                        AIC 29923.376934
    null_degrees_of_freedom 3743
residual_degrees_of_freedom 3741
▼ OUTPUT - VALIDATION_METRICS
             model_checksum 7115001551901653264
                      frame
```

```
model metalearner_AUTO_StackedEnsemble_BestOfFamily_AutoML_20190830_180
             frame_checksum 0
                description .
            model_category Regression
               scoring_time 1567162405897
               predictions ·
                       MSE 188.211241
                       RMSE 13.719010
                       nobs 1275
         custom_metric_name .
        custom_metric_value 0
                        r2 0.999162
    mean_residual_deviance 188.211241
                       mae 12.447246
                      rmsle 0.024633
         residual_deviance 239969.332585
             null deviance 286493907.671967
                        AIC 10304.188578
   null_degrees_of_freedom 1274
residual_degrees_of_freedom 1272
```

127.0.0.1:54321/flow/index.html# 15/16

### ▼ OUTPUT - CROSS\_VALIDATION\_METRICS

```
model StackedEnsemble_BestOfFamily_AutoML_20190830_180354
            model_checksum 1410290972738960780
                      frame levelone_training_StackedEnsemble_BestOfFamily_AutoML_20190830_18
             frame_checksum 1859632259469227142
                            5-fold cross-validation on training data (Metrics computed for
                description
                            combined holdout predictions)
            model_category Regression
              scoring_time 1567162406682
               predictions ·
                       MSE 281.694463
                       RMSE 16.783756
                       nobs 3744
        custom_metric_name •
        custom_metric_value 0
                        r2 0.998754
    mean_residual_deviance 281.694463
                       mae 14.367906
                      rmsle 0.033207
         residual_deviance 1054664.067717
             null_deviance 847241202.008546
                       AIC 31752.253114
   null_degrees_of_freedom 3743
residual_degrees_of_freedom 3741
```

▶ OUTPUT - HELP

127.0.0.1:54321/flow/index.html# 16/16