

Procedure 1:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: StoredProcedure [dbo].[sp_auc_logloss_gbm]  Script Date: 4/25/2019 2:20:38 PM
*****/
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
```

```
-- Author: <Author,,Name>
```

```
-- Create date: <Create Date,,>
```

```
-- Description: <Description,,>
```

```
-- =====
```

```
ALTER PROCEDURE [dbo].[sp_auc_logloss_gbm] (
```

```
    -- Add the parameters for the stored procedure here
```

```
@model_id nvarchar(100),
@auc float Output,
@logloss float Output
)

AS
BEGIN
-- SET NOCOUNT ON
-- interfering with SELECT statements.

-- Insert statements for procedure here
SELECT @auc=auc, @logloss=logloss FROM [Hyperparamter_PK].[dbo].[leaderboard] where
model_id = @model_id
--SET NOCOUNT ON;
END
GO
```

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery204.sql - is-swang01.ischool.uw.edu.Hyperparamter_PK (INFO6210 (68)) - Microsoft SQL Server Management Studio". The main area displays a T-SQL script:

```

USE [Hyperparamter_PK]
GO

DECLARE @return_value int,
        @auc float,
        @logloss float

EXEC    @return_value = [dbo].[sp_auc_logloss_gbm]
        @model_id = N'DeepLearning_1_AutoML_20190420_135144',
        @auc = @auc OUTPUT,
        @logloss = @logloss OUTPUT

SELECT  @auc as N'@auc',
        @logloss as N'@logloss'

SELECT  'Return Value' = @return_value

```

The results pane shows the output of the query:

@auc	0.90472327040788
@logloss	0.319802261454825

(1 row affected)

Return Value

0

(1 row affected)

Query executed successfully.

Procedure 2:

USE [Hyperparamter_PK]

GO

***** Object: StoredProcedure [dbo].[sp_dl_lead] Script Date: 4/25/2019 2:26:59 PM *****

SET ANSI_NULLS ON

GO

SET QUOTED_IDENTIFIER ON

GO

-- =====

-- Author: <Author,,Name>

-- Create date: <Create Date,,>

```
-- Description: <Description,,>
-- =====
ALTER PROCEDURE [dbo].[sp_dl_lead] (
    -- Add the parameters for the stored procedure here
    @model_id nvarchar(100),
    @categorical_encoding nvarchar(50) Output,
    @activation nvarchar(50) Output
)
AS
BEGIN
    -- SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    -- Insert statements for procedure here
    SELECT @activation = dl.activation, @categorical_encoding = dl.categorical_encoding FROM
    dbo.deepLearning_hyp dl INNER JOIN
        dbo.leaderboard ld ON dl.model_id = ld.model_id
        WHERE ld.model_id = @model_id
END
GO
```

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery208.sql - is-swang01.ischool.uw.edu.Hyperparamter_PK (INFO6210 (74)) - Microsoft SQL Server Management Studio". The main window has three tabs: "SQLQuery208.sql - ..._PK (INFO6210 (74))", "SQLQuery207.sql - ..._PK (INFO6210 (71))", and "SQLQuery206.sql - ..._PK (INFO6210 (64))". The left pane is the Object Explorer, showing the database structure with nodes like Triggers, Indexes, Statistics, Synonyms, Programmability (Stored Procedures, Functions), and System Functions. The right pane displays the query results for the stored procedure. The results table has two columns: "categorical_encoding" and "activation". One row is shown with values "AUTO" and "Rectifier". Below the table, it says "(1 row affected)". The status bar at the bottom indicates "Query executed successfully." and provides connection information: "is-swang01.ischool.uw.edu (74) | INFO6210 (74) | Hyperparamter_PK | 00:00:00 | 2 rows".

```
USE [Hyperparamter_PK]
GO

DECLARE @return_value int,
        @categorical_encoding nvarchar(50),
        @activation nvarchar(50)

EXEC   @return_value = [dbo].[sp_dl_lead]
        @model_id = N'DeepLearning_1_AutoML_20190420_135144',
        @categorical_encoding = @categorical_encoding OUTPUT,
        @activation = @activation OUTPUT

SELECT @categorical_encoding AS '@categorical_encoding',
       @activation AS '@activation'

SELECT 'Return Value' = @return_value
```

PROCEDURE 3:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: StoredProcedure [dbo].[sp_gbm_rf_sub] Script Date: 4/25/2019 2:29:48 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
-- Author:      <Author,,Name>
-- Create date: <Create Date,,>
-- Description: <Description,,>
-- =====

ALTER PROCEDURE [dbo].[sp_gbm_rf_sub](
    -- Add the parameters for the stored procedure here
    @distribution nvarchar(50),
    @fold_assignment nvarchar(50),
    @response_column nvarchar(50) Output,
    @ignored_columns nvarchar(50) Output
)
AS
BEGIN
    -- SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    -- Insert statements for procedure here
    SELECT @response_column = response_column , @ignored_columns = ignored_columns FROM
    [Hyperparamter_PK].[dbo].[gbm_hyp]
    WHERE
        min_split_improvement >= 1E-10 and min_split_improvement <= 1E-05
        AND nfolds in (select nfolds FROM [Hyperparamter_PK].[dbo].[randomForest_hyp] WHERE
        ntrees >= 50)
```

```

AND distribution = @distribution
AND fold_assignment = @fold_assignment
END
GO

```

RESULT 3:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists database objects like Triggers, Indexes, Statistics, and various stored procedures and functions under the 'Hyperparamter_PK' database. The central pane displays a T-SQL script for a stored procedure named 'sp_gbm_rf_sub'. The script declares variables for return_value, response_column, and ignored_columns, then executes a stored procedure 'dbo.sp_gbm_rf_sub' with these parameters. It then selects the response_column and ignored_columns, and finally returns the value of return_value. The results pane shows the output of this query, which includes a single row with 'response_column' set to 'income' and 'ignored_columns' set to '["education", "hours-per-week", "capital-loss"]'. The status bar at the bottom indicates the query was executed successfully.

```

SQLQuery210.sql - is-swang01.ischool.uw.edu.Hyperparamter_PK (INFO6210 (65)) - Microsoft SQL Server Management Studio
File Edit View Project Debug Tools Window Help
New Query Execute Debug
SQLQuery210.sql - ..._PK (INFO6210 (65)) + SQLQuery209.sql - ..._PK (INFO6210 (76)) SQLQuery207.sql - ..._PK (INFO6210 (71))
Object Explorer Connect
SQLQuery210.sql - ..._PK (INFO6210 (65)) + SQLQuery209.sql - ..._PK (INFO6210 (76)) SQLQuery207.sql - ..._PK (INFO6210 (71))
USE [Hyperparamter_PK]
GO
DECLARE @return_value int,
        @response_column nvarchar(50),
        @ignored_columns nvarchar(50)
EXEC   @return_value = [dbo].[sp_gbm_rf_sub]
        @distribution = N'bernoulli',
        @fold_assignment = N'Modulo',
        @response_column = @response_column OUTPUT,
        @ignored_columns = @ignored_columns OUTPUT
SELECT  @response_column AS N'@response_column',
        @ignored_columns AS N'@ignored_columns'
SELECT 'Return Value' = @return_value
Results
Response_column ----- Ignored_columns -----
income                                     ["education", "hours-per-week", "capital-loss"]
(1 row affected)
Return Value -----
0
(1 row affected)
Query executed successfully.
is-swang01.ischool.uw.edu (... | INFO6210 (65) | Hyperparamter_PK | 00:00:00 | 2 rows
Ready
Type here to search

```

PROCEDURE 4:

```

USE [Hyperparamter_PK]
GO

```

```
***** Object: StoredProcedure [dbo].[sp_predict] Script Date: 4/25/2019 2:31:02 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
-- Author:          <Author,,Name>
-- Create date: <Create Date,,>
-- Description:  <Description,,>
-- =====

ALTER PROCEDURE [dbo].[sp_predict] (
    -- Add the parameters for the stored procedure here
    @occupation nvarchar(50),
    @relationship nvarchar(50)
)

AS
BEGIN
    -- SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    -- Insert statements for procedure here
    SELECT age,workclass , predict , Count(capital_gain)
        FROM [Hyperparamter_PK].[dbo].[predictions] WHERE occupation = @occupation and
relationship = @relationship
        group by age,workclass,capital_gain , predict
END
GO
```

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists database objects like Triggers, Indexes, Statistics, and Stored Procedures. The central pane displays a T-SQL script for a stored procedure named [dbo].[sp_predict]. The script includes declarations, an EXEC statement, and a SELECT statement. Below the script is a results grid titled 'Results' showing a table with columns 'age', 'workclass', and 'predicts'. The results show various age ranges and workclass categories mapped to predict values (1 or 2). A status bar at the bottom indicates the query was executed successfully.

age	workclass	predicts
20	Local-gov	<=50K
21	Local-gov	<=50K
23	State-gov	<=50K
24	Private	<=50K
24	State-gov	>50K
25	Federal-gov	<=50K
25	Private	<=50K
25	Private	<=50K
26	Local-gov	>50K
26	Local-gov	>50K
26	Private	<=50K
26	State-gov	<=50K
27	Local-gov	>50K
28	Local-gov	<=50K
28	Local-gov	<=50K
28	Local-gov	<=50K

PROCEDURE 5:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: StoredProcedure [dbo].[sp_stacked] Script Date: 4/25/2019 2:32:34 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
```

```
-- Author: <Author,,Name>
```

```
-- Create date: <Create Date,,>
```

```
-- Description: <Description,,>
```

```
-- =====
```

```

ALTER PROCEDURE [dbo].[sp_stacked] (
    -- Add the parameters for the stored procedure here
    @metalearner_algorithm nvarchar(50),
    @metalearner_nfolds int,
    @model_id nvarchar(100) Output,
    @base_models nvarchar(50) Output
)
AS
BEGIN
    -- SET NOCOUNT ON added to prevent extra result sets from
    -- interfering with SELECT statements.
    SET NOCOUNT ON;

    -- Insert statements for procedure here
    SELECT @model_id = ld.model_id, @base_models = se.base_models FROM
    dbo.stackedEnsemble_hyp se
    INNER JOIN
        dbo.leaderboard ld ON se.model_id = ld.model_id
    WHERE response_column in (SELECT response_column FROM [Hyperparamter_PK].[dbo].[gbm_hyp])
    WHERE seed between -1 and 7
        and max_abs_leafnode_pred is not null)
    AND metalearner_algorithm = @metalearner_algorithm
    AND metalearner_nfolds = @metalearner_nfolds

END
GO

```

RESULT:

```

SQLQuery213.sql - is-swang01.ischool.uw.edu.Hyperparamter_PK (INFO6210 (69)) - Microsoft SQL Server Management Studio
File Edit View Query Project Debug Tools Window Help
Hyperparamter_PK Execute Debug
Object Explorer
SQLQuery213.sql -..._PK (INFO6210 (69)) SQLQuery212.sql -..._PK (INFO6210 (68)) SQLQuery211.sql -..._PK (INFO6210 (66))
USE [Hyperparamter_PK]
GO

DECLARE @return_value int,
        @model_id nvarchar(100),
        @base_models nvarchar(50)

EXEC   @return_value = [dbo].[sp_stacked]
        @metalearner_algorithm = N'AUTO',
        @metalearner_nfolds = 5,
        @model_id = @model_id OUTPUT,
        @base_models = @base_models OUTPUT

SELECT  @model_id AS [N'@model_id'],
        @base_models AS [N'@base_models']

SELECT  'Return Value' = @return_value

```

Model_Id	Base_Models
StackedEnsemble_BestOfFamily_AutoMD_20190420_162320	GBM_2_AutoMD_20190420_162320

(1 row affected)

Return Value

0

(1 row affected)

Query executed successfully.

FUNCTION1

:

USE [Hyperparamter_PK]

GO

***** Object: UserDefinedFunction [dbo].[f_dt_com] Script Date: 4/25/2019 2:35:42 PM *****

SET ANSI_NULLS ON

GO

SET QUOTED_IDENTIFIER ON

GO

-- =====

```

-- Author: <Author,,Name>
-- Create date: <Create Date,,>
-- Description: <Description,,>
-- =====

ALTER FUNCTION [dbo].[f_dt_com]
(
    -- Add the parameters for the function here
    @rmse int,
    @auc int
)
RETURNS TABLE

AS
RETURN

    -- Fill the table variable with the rows for your result set
    SELECT gb.categorical_encoding, gb.ignored_columns, rf.build_tree_one_node,
    rf.fold_assignment,
    xr.mtries, xr.nbins_cats, xr.ntrees

FROM
    dbo.leaderboard ld Full JOIN
    dbo.gbm_hyp gb ON ld.model_id = gb.model_id Full JOIN
    dbo.randomForest_hyp rf ON ld.model_id = rf.model_id full JOIN
    dbo.xrt_hyp xr ON ld.model_id = xr.model_id

WHERE ld.rmse = @rmse
AND ld.auc = @auc
AND gb.categorical_encoding like '%AUTO%'

OR

```

```
rf.distribution in ('multinomial', 'AUTO')
```

```
GO
```

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists various database objects like Stored Procedures, Functions, and Assemblies. The central pane displays a query window with the following content:

```
USE [Hyperparamter_PK]
GO

SELECT * FROM [dbo].[f_dt_com] (
    0.319805145480323
    ,0.98472327940788)
GO
```

The results pane shows a table with the following data:

categorical_encoding	ignored_columns	build_trees_one_node	fold_assignment
NULL	NULL	0	Module
NULL	NULL	0	AUTO
NULL	NULL	0	Module
NULL	NULL	0	AUTO
NULL	NULL	0	Module
NULL	NULL	0	AUTO

(6 rows affected)

At the bottom of the results pane, a green status bar indicates: "Query executed successfully." Below the results pane, the status bar shows: "is-swang01.ischool.uw.edu ... INFO6210 (66) Hyperparamter_PK 00:00:00 | 6 rows".

FUNCTION 2:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: UserDefinedFunction [dbo].[f_pred_model]  Script Date: 4/25/2019 2:39:02 PM
*****/
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```

-- =====
-- Author: <Author,,Name>
-- Create date: <Create Date,,>
-- Description: <Description,,>
-- =====

ALTER FUNCTION [dbo].[f_pred_model](
    -- Add the parameters for the function here
    @relationship nvarchar(50),
    @education nvarchar(50)
)

RETURNS TABLE
AS
RETURN
(
    -- Fill the table variable with the rows for your result set
    SELECT workclass, predict, income, SUM(hours_per_week) as Total_hours FROM dbo.predictions
        WHERE education = @education
        AND relationship = @relationship
        GROUP BY workclass, predict, income, hours_per_week
        HAVING hours_per_week >= 20
)
GO

```

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays various database objects under the 'Hyperparamter_PK' database. The central pane contains a query window with the following script:

```
USE [Hyperparamter_PK]
GO
SELECT * FROM [dbo].[f_pred_model] (
    'husband'
    , 'Prof-specialty'
)
GO
```

The results pane shows the output of the query:

workclass	presties	income	label
(0 rows affected)			

At the bottom of the screen, the taskbar shows the Windows Start button, a search bar, and several pinned application icons. The system tray indicates the date and time as 4/25/2019 2:42 PM.

Function 3:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: UserDefinedFunction [dbo].[f_se_lead] Script Date: 4/25/2019 2:42:21 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
```

```
-- Author: <Author,,Name>
```

```
-- Create date: <Create Date,,>
```

```
-- Description: <Description,,>
```

```
-- =====
ALTER FUNCTION [dbo].[f_se_lead]
(
    -- Add the parameters for the function here
    @model_id nvarchar(100),
    @metalearner_algorithm nvarchar(50)
)
RETURNS TABLE
RETURN
(
    -- Fill the table variable with the rows for your result set
    SELECT max(mse) as Maximum_MSE, logloss, metalearner_nfolds , base_models
    FROM dbo.stackedEnsemble_hyp se INNER JOIN
        dbo.leaderboard ld ON se.model_id = ld.model_id
        WHERE se.model_id = @model_id
        AND metalearner_algorithm = @metalearner_algorithm
        GROUP BY base_models, logloss, metalearner_nfolds
)
GO
```

RESULT:

```

USE [Hyperparameter_PK]
GO

SELECT * FROM [dbo].[f_se_lead] (
    'StackedEnsemble_BestOfFamily_AutoML_20190420_135144'
)
GO

```

Maximum_MSE	logloss	metalearner_nfolds	base_models
0.0971734867320091	0.31410496211009	0	GSM_1_AutoML_20190420_135144
0.0971734867320091	0.31410496211009	5	GSM_1_AutoML_20190420_135144

(2 rows affected)

Query executed successfully.

FUNCTION 4:

```
USE [Hyperparameter_PK]
```

```
GO
```

```
***** Object: UserDefinedFunction [dbo].[f_dl_hidden] Script Date: 4/25/2019 2:44:42 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
```

```
-- Author: <Author,,Name>
```

```
-- Create date: <Create Date, ,>
```

```
-- Description: <Description, ,>
```

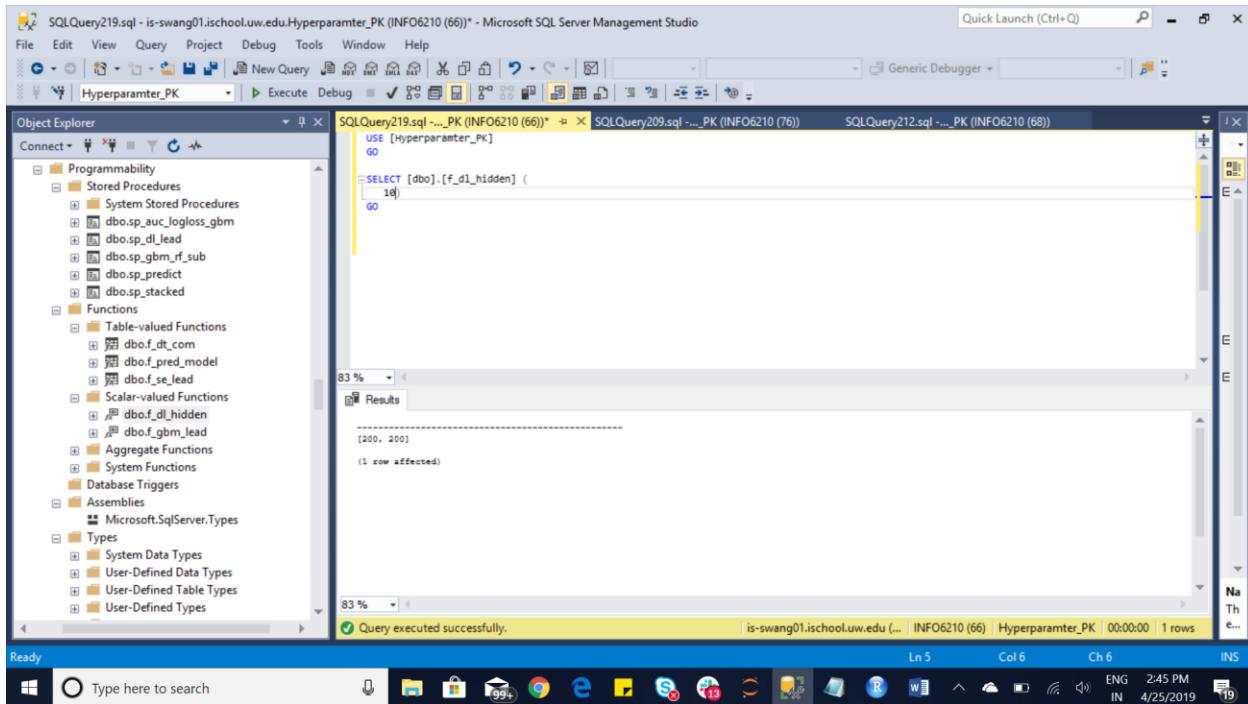
```

-- =====
ALTER FUNCTION [dbo].[f_dl_hidden]
(
    -- Add the parameters for the function here
    @epochs float
)
RETURNS nvarchar(50)
AS
BEGIN
    -- Declare the return variable here
    DECLARE @hidden nvarchar(50)

    -- Add the T-SQL statements to compute the return value here
    SELECT @hidden = hidden
    FROM dbo.deepLearning_hyp dl INNER JOIN
        dbo.leaderboard ld ON dl.model_id = ld.model_id
        WHERE quantile_alpha between 0 AND 1
        AND initial_weight_distribution in ('Uniform',
        'UniformAdaptive', 'Normal')
        AND epochs = @epochs
        IF (@hidden IS NULL)
            SET @hidden = 0;

    -- Return the result of the function
    RETURN @hidden
END
GO
RESULT:

```



FUNCTION 5:

```
USE [Hyperparameter_PK]
```

```
GO
```

```
***** Object: UserDefinedFunction [dbo].[f_gbm_lead] Script Date: 4/25/2019 2:47:40 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
-- =====
```

```
-- Author: <Author,,Name>
```

```
-- Create date: <Create Date, ,>
```

```
-- Description: <Description, ,>
```

```
-- =====
```

```

ALTER FUNCTION [dbo].[f_gbm_lead]
(
    -- Add the parameters for the function here
    @learn_rate float
)
RETURNS int
AS
BEGIN
    -- Declare the return variable here
    DECLARE @auc int

    -- Add the T-SQL statements to compute the return value here
    SELECT  @auc = max(lId.auc)
    FROM      dbo.gbm_hyp gb INNER JOIN
              dbo.leaderboard lId ON gb.model_id = lId.model_id
    WHERE distribution in ('bernoulli', 'quasibinomial', 'multinomial', 'poisson',
                           'laplace', 'tweedie', 'gaussian', 'huber', 'gamma',
                           'quantile')
        AND min_split_improvement >= 1e-10 and min_split_improvement <= 1e-3
        AND learn_rate = @learn_rate
        Group by lId.auc
    IF (@auc IS NULL)
        SET @auc = 0;

    -- Return the result of the function
    RETURN @auc
END
GO

```

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists various database objects under the 'Hyperparamter_PK' database, including Programmability, Functions, and Types. The central pane displays a query results window for a SELECT statement. The command is:

```
USE [Hyperparamter_PK]
GO
SELECT [dbo].[f_gbm_lead] (
    @.1)
GO
```

The results pane shows the output of the query:

```
83 % ▾
Results
-----
0
(1 row affected)
```

A status bar at the bottom indicates "Query executed successfully." and provides connection information: "is-swang01.ischool.uw.edu (..." | INFO6210 (69) | Hyperparamter_PK | 00:00:00 | 1 rows". The taskbar at the bottom of the screen shows the Windows Start button, a search bar, and several pinned application icons.

Views 1:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: View [dbo].[v_dL_lead]  Script Date: 4/25/2019 2:51:16 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
ALTER VIEW [dbo].[v_dL_lead]
AS
SELECT      dbo.leaderboard.*,
            dbo.deepLearning_hyp.activation,
            dbo.deepLearning_hyp.adaptive_rate,
            dbo.deepLearning_hyp.autoencoder,
            dbo.deepLearning_hyp.average_activation,
            dbo.deepLearning_hyp.balance_classes,
            dbo.deepLearning_hyp.categorical_encoding,
            dbo.deepLearning_hyp.[checkpoint],
            dbo.deepLearning_hyp.class_sampling_factors,
            dbo.deepLearning_hyp.classification_stop,
            dbo.deepLearning_hyp.col_major,
            dbo.deepLearning_hyp.diagnostics,
            dbo.deepLearning_hyp.distribution,
            dbo.deepLearning_hyp.elastic_averaging,
            dbo.deepLearning_hyp.elastic_averaging_moving_rate,
            dbo.deepLearning_hyp.elastic_averaging_regularization,
            dbo.deepLearning_hyp.epochs,
            dbo.deepLearning_hyp.epsilon,
            dbo.deepLearning_hyp.export_checkpoints_dir,
            dbo.deepLearning_hyp.export_weights_and_biases,
            dbo.deepLearning_hyp.fast_mode,
            dbo.deepLearning_hyp.fold_assignment,
            dbo.deepLearning_hyp.fold_column,
            dbo.deepLearning_hyp.keep_cross_validation_predictions,
            dbo.deepLearning_hyp.keep_cross_validation_models,
            dbo.deepLearning_hyp.keep_cross_validation_fold_assignment,
            dbo.deepLearning_hyp.input_dropout_ratio,
            dbo.deepLearning_hyp.initial_weights,
            dbo.deepLearning_hyp.initial_weight_scale,
            dbo.deepLearning_hyp.initial_biases,
            dbo.deepLearning_hyp.ignored_columns,
            dbo.deepLearning_hyp.ignore_const_cols,
            dbo.deepLearning_hyp.huber_alpha,
            dbo.deepLearning_hyp.hidden_dropout_ratios,
            dbo.deepLearning_hyp.initial_weight_distribution,
            dbo.deepLearning_hyp.hidden,
            dbo.deepLearning_hyp.force_load_balance,
            dbo.deepLearning_hyp.max_w2,
            dbo.deepLearning_hyp.max_runtime_secs,
            dbo.deepLearning_hyp.max_hit_ratio_k,
            dbo.deepLearning_hyp.mini_batch_size,
            dbo.deepLearning_hyp.missing_values_handling,
            dbo.deepLearning_hyp.model_id AS Expr1,
```

```

    dbo.deepLearning_hyp.momentum_ramp, dbo.deepLearning_hyp.momentum_stable,
dbo.deepLearning_hyp.momentum_start, dbo.deepLearning_hyp.nesterov_accelerated_gradient,
dbo.deepLearning_hyp.nfolds,

    dbo.deepLearning_hyp.offset_column,
dbo.deepLearning_hyp.overwrite_with_best_model, dbo.deepLearning_hyp.pretrained_autoencoder,
dbo.deepLearning_hyp.quantile_alpha, dbo.deepLearning_hyp.rate,

    dbo.deepLearning_hyp.rate_annealing, dbo.deepLearning_hyp.rate_decay,
dbo.deepLearning_hyp.regression_stop, dbo.deepLearning_hyp.replicate_training_data,
dbo.deepLearning_hyp.reproducible,

    dbo.deepLearning_hyp.response_column, dbo.deepLearning_hyp.rho,
dbo.deepLearning_hyp.score_duty_cycle, dbo.deepLearning_hyp.score_each_iteration,
dbo.deepLearning_hyp.score_interval, dbo.deepLearning_hyp.loss,

    dbo.deepLearning_hyp.validation_frame, dbo.deepLearning_hyp.use_all_factor_levels,
dbo.deepLearning_hyp.tweedie_power, dbo.deepLearning_hyp.variable_importances,
dbo.deepLearning_hyp.weights_column,

    dbo.deepLearning_hyp.train_samples_per_iteration,
dbo.deepLearning_hyp.training_frame, dbo.deepLearning_hyp.target_ratio_comm_to_comp,
dbo.deepLearning_hyp.stopping_tolerance,

    dbo.deepLearning_hyp.stopping_rounds, dbo.deepLearning_hyp.stopping_metric,
dbo.deepLearning_hyp.standardize, dbo.deepLearning_hyp.shuffle_training_data,
dbo.deepLearning_hyp.score_validation_sampling,

    dbo.deepLearning_hyp.score_validation_samples,
dbo.deepLearning_hyp.single_node_mode, dbo.deepLearning_hyp.sparse,
dbo.deepLearning_hyp.sparsity_beta, dbo.deepLearning_hyp.quiet_mode

```

```

FROM      dbo.deepLearning_hyp INNER JOIN
          dbo.leaderboard ON dbo.deepLearning_hyp.model_id = dbo.leaderboard.model_id
WHERE
          activation in ('Tanh', 'TanhWithDropout', 'Rectifier',
'RectifierWithDropout'
          , 'Maxout', 'MaxoutWithDropout')
AND epochs >= 9
          AND epsilon >= 1.0e-10 AND epsilon <= 1.0e-4
          AND quantile_alpha between 0 AND 1

```

AND initial_weight_distribution in ('Uniform',
'UniformAdaptive', 'Normal')

GO

RESULT:

```
SQLQuery221.sql - is-swang01.ischool.uw.edu.Hyperparamter_PK (INFO6210 (66)) - Microsoft SQL Server Management Studio
File Edit View Query Project Debug Tools Window Help
New Query Execute Debug
Object Explorer
Connect > Hyperparamter_PK > Execute > Results > Messages
SQLQuery221.sql - ..._PK (INFO6210 (66)) > X SQLQuery220.sql - ..._PK (INFO6210 (69)) > SQLQuery209.sql - ..._PK (INFO6210 (76))
SELECT TOP (1000) [column_1]
,[Unnamed_0]
,[model_id]
,[auc]
,[logloss]
,[mean_per_class_error]
,[rmse]
,[mse]
,[activation]
,[adaptive_rate]
,[autoencoder]
,[average_activation]
,[balance_classes]
,[categorical_encoding]
,[checkpoint]
,[class_sampling_factors]
Results Messages
column_1 Unnamed_0 model_id auc logloss mean_per_class_error rmse msk
1 3 9 DeepLearning_1_AutoML_20190420_135144 0.90472327040788 0.319802261454825 0.18889955976145 0.319805145480323 0.1
2 3 9 DeepLearning_1_AutoML_20190420_135144 0.90472327040788 0.319802261454825 0.18889955976145 0.319805145480323 0.1
Query executed successfully. is-swang01.ischool.uw.edu (... | INFO6210 (66) | Hyperparamter_PK | 00:00:00 | 2 rows
Ready Ln 1 Col 1 Ch 1 INS
Type here to search
2:51 PM
ENGLISH
4/25/2019
```

View2:

USE [Hyperparamter_PK]

GO

***** Object: View [dbo].[v_gbm_lead] Script Date: 4/25/2019 2:52:04 PM *****

SET ANSI_NULLS ON

GO

SET QUOTED_IDENTIFIER ON

GO

```

ALTER VIEW [dbo].[v_gbm_lead]
AS
SELECT      dbo.gbm_hyp.balance_classes, dbo.gbm_hyp.build_tree_one_node,
dbo.gbm_hyp.calibrate_model, dbo.gbm_hyp.calibration_frame, dbo.gbm_hyp.categorical_encoding,
dbo.gbm_hyp.check_constant_response,
            dbo.gbm_hyp.[checkpoint], dbo.gbm_hyp.class_sampling_factors,
dbo.gbm_hyp.col_sample_rate, dbo.gbm_hyp.col_sample_rate_change_per_level,
dbo.gbm_hyp.custom_metric_func, dbo.gbm_hyp.col_sample_rate_per_tree,
            dbo.gbm_hyp.distribution, dbo.gbm_hyp.export_checkpoints_dir,
dbo.gbm_hyp.fold_assignment, dbo.gbm_hyp.fold_column, dbo.gbm_hyp.histogram_type,
dbo.gbm_hyp.huber_alpha, dbo.gbm_hyp.ignore_const_cols,
            dbo.gbm_hyp.ignored_columns, dbo.gbm_hyp.keep_cross_validation_fold_assignment,
dbo.gbm_hyp.keep_cross_validation_models, dbo.gbm_hyp.keep_cross_validation_predictions,
dbo.gbm_hyp.learn_rate,
            dbo.gbm_hyp.learn_rate_annealing, dbo.gbm_hyp.max_abs_leafnode_pred,
dbo.gbm_hyp.max_after_balance_size, dbo.gbm_hyp.max_confusion_matrix_size,
dbo.gbm_hyp.max_depth, dbo.gbm_hyp.max_hit_ratio_k,
            dbo.gbm_hyp.max_runtime_secs, dbo.gbm_hyp.min_rows,
dbo.gbm_hyp.min_split_improvement, dbo.gbm_hyp.model_id, dbo.gbm_hyp.monotone_constraints,
dbo.gbm_hyp.nbins, dbo.gbm_hyp.nbins_cats,
            dbo.gbm_hyp.nbins_top_level, dbo.gbm_hyp.nfolds, dbo.gbm_hyp.ntrees,
dbo.gbm_hyp.offset_column, dbo.gbm_hyp.pred_noise_bandwidth, dbo.gbm_hyp.quantile_alpha,
dbo.gbm_hyp.r2_stopping,
            dbo.gbm_hyp.response_column, dbo.gbm_hyp.sample_rate,
dbo.gbm_hyp.sample_rate_per_class, dbo.gbm_hyp.score_each_iteration,
dbo.gbm_hyp.score_tree_interval, dbo.gbm_hyp.tweedie_power,
            dbo.gbm_hyp.weights_column, dbo.leaderboard.model_id AS Expr1,
dbo.leaderboard.auc, dbo.leaderboard.logloss, dbo.leaderboard.mean_per_class_error,
dbo.leaderboard.rmse, dbo.leaderboard.mse
FROM        dbo.gbm_hyp INNER JOIN
            dbo.leaderboard ON dbo.gbm_hyp.model_id = dbo.leaderboard.model_id
WHERE       ntrees >= 50
            AND distribution IN ('bernoulli', 'quasibinomial',
'multinomial', 'poisson',
            'laplace', 'tweedie', 'gaussian', 'huber', 'gamma',
'quantile')

```

```

AND categorical_encoding in ('AUTO', 'Enum',
'EnumLimited', 'OneHotExplicit',
'Eigen', 'LabelEncoder', 'SortByResponse')

AND min_split_improvement >= 1e-10 and
min_split_improvement <= 1e-3

```

GO

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists various database objects like Columns, Keys, Constraints, Triggers, Indexes, and Statistics for several views such as dbo.v_dl_lead, dbo.v_gbm_lead, and dbo.v_glm_xrt_lead. The central Results pane displays the output of a query on the Hyperparamter_PK view. The query is:

```

SELECT TOP 1000 [balance_classes]
,[build_tree_one_node]
,[calibrate_model]
,[calibration_frame]
,[categorical_encoding]
,[check_constant_response]
,[checkpoint]
,[class_sampling_factors]
,[col_sample_rate]
,[col_sample_rate_change_per_level]
,[custom_metric_func]
,[col_sample_rate_per_tree]
,[distribution]
,[export_checkpoints_dir]
,[fold_assignment]
,[fold_column]
...

```

The results table has columns: balance_classes, build_tree_one_node, calibrate_model, calibration_frame, categorical_encoding, check_constant_response, checkpoint, class_sampling_factors. The data is:

	balance_classes	build_tree_one_node	calibrate_model	calibration_frame	categorical_encoding	check_constant_response	checkpoint	class_sampling_factors
1	0	0	NULL	AUTO	1	NULL	NULL	NULL
2	0	0	NULL	AUTO	1	NULL	NULL	NULL
3	0	0	NULL	AUTO	1	NULL	NULL	NULL

At the bottom of the Results pane, it says "Query executed successfully." The status bar at the bottom right shows "is-swang01.ischool.uw.edu (... | INFO6210 (72) | Hyperparamter_PK | 00:00:00 | 3 rows".

View 3:

USE [Hyperparamter_PK]

GO

```
***** Object: View [dbo].[v_glm_xrt_lead] Script Date: 4/25/2019 2:53:13 PM *****
```

SET ANSI_NULLS ON

GO

```
SET QUOTED_IDENTIFIER ON  
GO
```

```
ALTER VIEW [dbo].[v_glm_xrt_lead]  
AS  
SELECT      dbo.glm_hyp.alpha, dbo.glm_hyp.balance_classes, dbo.glm_hyp.beta_constraints,  
dbo.glm_hyp.beta_epsilon, dbo.glm_hyp.class_sampling_factors, dbo.glm_hyp.compute_p_values,  
dbo.glm_hyp.custom_metric_func,  
            dbo.glm_hyp.early_stopping, dbo.glm_hyp.export_checkpoints_dir, dbo.glm_hyp.family,  
dbo.glm_hyp.fold_assignment, dbo.glm_hyp.fold_column, dbo.glm_hyp.gradient_epsilon,  
dbo.glm_hyp.ignore_const_cols,  
            dbo.glm_hyp.ignored_columns, dbo.glm_hyp.interaction_pairs, dbo.glm_hyp.interactions,  
dbo.glm_hyp.intercept, dbo.glm_hyp.lambda, dbo.glm_hyp.lambda_min_ratio,  
dbo.glm_hyp.lambda_search, dbo.glm_hyp.link,  
            dbo.glm_hyp.max_active_predictors, dbo.glm_hyp.max_after_balance_size,  
dbo.glm_hyp.max_confusion_matrix_size, dbo.glm_hyp.max_iterations, dbo.glm_hyp.max_hit_ratio_k,  
dbo.glm_hyp.max_runtime_secs,  
            dbo.glm_hyp.missing_values_handling, dbo.glm_hyp.model_id, dbo.glm_hyp.nfolds,  
dbo.glm_hyp.nlambdas, dbo.glm_hyp.non_negative, dbo.glm_hyp.obj_reg,  
dbo.glm_hyp.objective_epsilon, dbo.glm_hyp.offset_column,  
            dbo.glm_hyp.prior, dbo.glm_hyp.remove_collinear_columns,  
dbo.glm_hyp.response_column, dbo.glm_hyp.score_each_iteration, dbo.glm_hyp.solver,  
dbo.glm_hyp.training_frame, dbo.glm_hyp.tweedie_link_power,  
            dbo.glm_hyp.tweedie_variance_power, dbo.glm_hyp.validation_frame,  
dbo.glm_hyp.weights_column, dbo.glm_hyp.standardize, dbo.glm_hyp.theta,  
dbo.randomForest_hyp.balance_classes AS rf_balance_classes,  
            dbo.randomForest_hyp.binomial_double_trees,  
dbo.randomForest_hyp.build_tree_one_node, dbo.randomForest_hyp.calibrate_model,  
dbo.randomForest_hyp.calibration_frame, dbo.randomForest_hyp.categorical_encoding,  
            dbo.randomForest_hyp.check_constant_response, dbo.randomForest_hyp.[checkpoint],  
dbo.randomForest_hyp.class_sampling_factors AS rf_class_sampling_factors,  
dbo.randomForest_hyp.col_sample_rate_change_per_level,
```

```

        dbo.randomForest_hyp.col_sample_rate_per_tree,
dbo.randomForest_hyp.custom_metric_func AS rf_custom_metric_func,
dbo.randomForest_hyp.distribution, dbo.randomForest_hyp.export_checkpoints_dir AS
rf_export_checkpoints_dir,
        dbo.randomForest_hyp.fold_assignment AS rf_fold_assignment,
dbo.randomForest_hyp.histogram_type, dbo.randomForest_hyp.fold_column AS rf_fold_column,
dbo.randomForest_hyp.ignore_const_cols AS rf_ignore_const_cols,
        dbo.randomForest_hypignored_columns AS rf_ignored_columns,
dbo.randomForest_hyp.keep_cross_validation_fold_assignment,
dbo.randomForest_hyp.keep_cross_validation_models,
        dbo.randomForest_hyp.keep_cross_validation_predictions,
dbo.randomForest_hyp.max_after_balance_size AS rf_max_after_balance_size,
dbo.randomForest_hyp.max_confusion_matrix_size AS rf_max_confusion_matrix_size,
dbo.randomForest_hyp.max_depth,
        dbo.randomForest_hyp.max_hit_ratio_k AS rf_max_hit_ratio_k,
dbo.randomForest_hyp.max_runtime_secs AS rf_max_runtime_secs, dbo.randomForest_hyp.min_rows,
dbo.randomForest_hyp.min_split_improvement,
        dbo.randomForest_hyp.model_id AS rf_model_id, dbo.randomForest_hyp.mtries,
dbo.randomForest_hyp.nbins, dbo.randomForest_hyp.nbins_cats,
dbo.randomForest_hyp.nbins_top_level, dbo.randomForest_hyp.nfolds AS rf_nfolds,
        dbo.randomForest_hyp.ntrees, dbo.randomForest_hyp.offset_column AS
rf_offset_column, dbo.randomForest_hyp.r2_stopping, dbo.randomForest_hyp.response_column AS
rf_response_column, dbo.randomForest_hyp.sample_rate,
        dbo.randomForest_hyp.sample_rate_per_class,
dbo.randomForest_hyp.score_each_iteration AS rf_score_each_iteration,
dbo.randomForest_hyp.score_tree_interval, dbo.randomForest_hyp.seed,
dbo.randomForest_hyp.stopping_metric,
        dbo.randomForest_hyp.stopping_rounds, dbo.randomForest_hyp.stopping_tolerance,
dbo.randomForest_hyp.training_frame AS rf_training_frame, dbo.randomForest_hyp.validation_frame
AS rf_validation_frame,
        dbo.randomForest_hyp.weights_column AS rf_weights_column,
dbo.leaderboard.model_id AS Id_model_id, dbo.leaderboard.auc, dbo.leaderboard.logloss,
dbo.leaderboard.mean_per_class_error, dbo.leaderboard.rmse,
        dbo.leaderboard.mse
FROM      dbo.glm_hyp INNER JOIN
          dbo.leaderboard ON dbo.glm_hyp.model_id = dbo.leaderboard.model_id full join
          dbo.randomForest_hyp ON dbo.leaderboard.model_id = dbo.randomForest_hyp.model_id

```

WHERE mtries between -1 and 7

AND histogram_type like '%AUTO%' or histogram_type like '%Uniform%' or histogram_type like '%Random%'

or histogram_type like '%Global' or histogram_type like '%RoundRobin%'

AND theta >= 0

AND solver in ('AUTO', 'IRLSM', 'L_BFGS',
'COORDINATE_DESCENT_NAIVE', 'COORDINATE_DESCENT', 'GRADIENT_DESCENT_LH')

AND logloss >= 0.3

AND mse >= 0.1

GO

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists several database objects including tables like 'Hyperparamter_PK', 'dbo.v_dl_lead', 'dbo.v_gbm_lead', etc. The central Results pane displays the output of a query against the 'Hyperparamter_PK' table. The query is a SELECT statement with a top clause and various parameters listed. The results show six rows of data with columns: f_export_checkpoints_dir, rf_fold_assignment, histogram_type, rf_fold_column, rf_ignore_const_cols, rf_ignored_columns, and keep_cross_validation_. The data is as follows:

	f_export_checkpoints_dir	rf_fold_assignment	histogram_type	rf_fold_column	rf_ignore_const_cols	rf_ignored_columns	keep_cross_validation_
1	NULL	Modulo	AUTO	NULL	1	[hours-per-week', 'gender', 'capital-loss]	0
2	NULL	AUTO	AUTO	NULL	1	NULL	0
3	NULL	Modulo	AUTO	NULL	1	['education', 'hours-per-week', 'capital-loss']	0
4	NULL	AUTO	AUTO	NULL	1	NULL	0
5	NULL	Modulo	AUTO	NULL	1	['education', 'hours-per-week', 'capital-loss']	0
6	NULL	AUTO	AUTO	NULL	1	NULL	0

At the bottom of the Results pane, it says "Query executed successfully." and shows the session details: is-swang01.ischool.uw.edu (73) | INFO6210 (73) | Hyperparamter_PK | 00:00:00 | 6 rows.

View 4:

USE [Hyperparamter_PK]

GO

***** Object: View [dbo].[v_rand_gbm_xrt_lead] Script Date: 4/25/2019 2:56:37 PM *****

SET ANSI_NULLS ON

GO

SET QUOTED_IDENTIFIER ON

GO

ALTER VIEW [dbo].[v_rand_gbm_xrt_lead]

AS

```
SELECT      dbo.gbm_hyp.balance_classes, dbo.gbm_hyp.build_tree_one_node,
dbo.gbm_hyp.check_constant_response, dbo.gbm_hyp.[checkpoint], dbo.gbm_hyp.calibrate_model,
dbo.gbm_hyp.calibration_frame,
          dbo.gbm_hyp.categorical_encoding, dbo.gbm_hyp.export_checkpoints_dir,
dbo.gbm_hyp.fold_assignment, dbo.gbm_hyp.fold_column, dbo.gbm_hyp.histogram_type,
dbo.gbm_hyp.huber_alpha,
          dbo.gbm_hyp.ignore_const_cols, dbo.gbm_hyp.ignored_columns,
dbo.gbm_hyp.keep_cross_validation_fold_assignment, dbo.gbm_hyp.learn_rate_annealing,
dbo.gbm_hyp.learn_rate, dbo.gbm_hyp.max_abs_leafnode_pred,
          dbo.gbm_hyp.max_after_balance_size, dbo.gbm_hyp.max_confusion_matrix_size,
dbo.gbm_hyp.max_depth, dbo.gbm_hyp.max_hit_ratio_k, dbo.gbm_hyp.max_runtime_secs,
dbo.gbm_hyp.min_rows,
          dbo.gbm_hyp.min_split_improvement, dbo.gbm_hyp.model_id,
dbo.gbm_hyp.monotone_constraints, dbo.gbm_hyp.nbins, dbo.gbm_hyp.nbins_cats,
dbo.gbm_hyp.nbins_top_level, dbo.gbm_hyp.nfolds, dbo.gbm_hyp.ntrees,
          dbo.gbm_hyp.offset_column, dbo.gbm_hyp.pred_noise_bandwidth,
dbo.gbm_hyp.quantile_alpha, dbo.gbm_hyp.r2_stopping, dbo.gbm_hyp.response_column,
dbo.gbm_hyp.sample_rate, dbo.gbm_hyp.sample_rate_per_class,
```

dbo.gbm_hyp.score_each_iteration, dbo.gbm_hyp.score_tree_interval,
dbo.gbm_hyp.tweedie_power, dbo.gbm_hyp.weights_column, dbo.gbm_hyp.validation_frame,
dbo.leaderboard.model_id AS Id_model_id, dbo.leaderboard.auc,

dbo.leaderboard.logloss, dbo.leaderboard.mean_per_class_error, dbo.leaderboard.rmse,
dbo.leaderboard.mse, dbo.randomForest_hyp.balance_classes AS rf_balance_classes,
dbo.randomForest_hyp.binomial_double_trees,

dbo.randomForest_hyp.build_tree_one_node AS rf_build_tree_one_node,
dbo.randomForest_hyp.calibrate_model AS rf_calibrate_model,
dbo.randomForest_hyp.calibration_frame AS rf_calibration_frame,
dbo.randomForest_hyp.categorical_encoding AS rf_categorical_encoding,

dbo.randomForest_hyp.check_constant_response AS rf_check_constant_response,
dbo.randomForest_hyp.[checkpoint] AS rf_checkpoint, dbo.randomForest_hyp.class_sampling_factors,
dbo.randomForest_hyp.col_sample_rate_change_per_level,

dbo.randomForest_hyp.col_sample_rate_per_tree,
dbo.randomForest_hyp.custom_metric_func, dbo.randomForest_hyp.distribution,
dbo.randomForest_hyp.export_checkpoints_dir AS rf_export_checkpoints_dir,

dbo.randomForest_hyp.fold_assignment AS rf_fold_assignment,
dbo.randomForest_hyp.fold_column AS rf_fold_column, dbo.randomForest_hyp.histogram_type AS
rf_histogram_type, dbo.randomForest_hyp.ignore_const_cols AS rf_ignore_const_cols,

dbo.randomForest_hyp.ignored_columns AS rf_ignored_columns,
dbo.randomForest_hyp.keep_cross_validation_fold_assignment AS
rf_keep_cross_validation_fold_assignment, dbo.randomForest_hyp.keep_cross_validation_models,

dbo.randomForest_hyp.keep_cross_validation_predictions,
dbo.randomForest_hyp.max_after_balance_size AS rf_max_after_balance_size,
dbo.randomForest_hyp.max_confusion_matrix_size AS rf_max_confusion_matrix_size,

dbo.randomForest_hyp.max_depth AS rf_max_depth,
dbo.randomForest_hyp.max_hit_ratio_k AS rf_max_hit_ratio_k,
dbo.randomForest_hyp.max_runtime_secs AS rf_max_runtime_secs,
dbo.randomForest_hyp.min_split_improvement AS rf_min_split_improvement,

dbo.randomForest_hyp.min_rows AS rf_min_rows, dbo.randomForest_hyp.model_id AS
rf_model_id, dbo.randomForest_hyp.mtries, dbo.randomForest_hyp.nbins AS rf_nbins,
dbo.randomForest_hyp.nbins_cats AS rf_nbins_cats,

dbo.randomForest_hyp.nbins_top_level AS rf_nbins_top_level,
dbo.randomForest_hyp.nfolds AS rf_nfolds, dbo.randomForest_hyp.ntrees AS rf_ntrees,
dbo.randomForest_hyp.offset_column AS rf_offset_column,

dbo.randomForest_hyp.r2_stopping AS rf_r2_stopping,
dbo.randomForest_hyp.response_column AS rf_response_column, dbo.randomForest_hyp.sample_rate
AS rf_sample_rate, dbo.randomForest_hyp.sample_rate_per_class AS rf_sample_rate_per_class,

dbo.xrt_hyp.balance_classes AS xr_balance_classes, dbo.xrt_hyp.binomial_double_trees
 AS xr_binomial_double_trees, dbo.xrt_hyp.build_tree_one_node AS xr_build_tree_one_node,
 dbo.xrt_hyp.calibration_frame AS xr_calibration_frame, dbo.xrt_hyp.categorical_encoding AS
 xr_categorical_encoding,

 dbo.xrt_hyp.check_constant_response AS xr_check_constant_response,
 dbo.xrt_hyp.[checkpoint] AS xr_checkpoint, dbo.xrt_hyp.class_sampling_factors AS
 xr_class_sampling_factors, dbo.xrt_hyp.col_sample_rate_change_per_level AS
 xr_col_sample_rate_change_per_level,

 dbo.xrt_hyp.col_sample_rate_per_tree AS xr_col_sample_rate_per_tree,
 dbo.xrt_hyp.custom_metric_func AS xr_custom_metric_func, dbo.xrt_hyp.distribution AS
 xr_distribution, dbo.xrt_hyp.export_checkpoints_dir AS xr_export_checkpoints_dir,
 dbo.xrt_hyp.fold_assignment AS xr_fold_assignment,

 dbo.xrt_hyp.fold_column AS xr_fold_column, dbo.xrt_hyp.histogram_type AS
 xr_histogram_type, dbo.xrt_hyp.ignore_const_cols AS xr_ignore_const_cols,
 dbo.xrt_hyp.ignored_columns AS xr_ignored_columns,
 dbo.xrt_hyp.keep_cross_validation_fold_assignment AS xr_keep_cross_validation_fold_assignment,

 dbo.xrt_hyp.keep_cross_validation_models AS xr_keep_cross_validation_models,
 dbo.xrt_hyp.keep_cross_validation_predictions AS xr_keep_cross_validation_predictions,
 dbo.xrt_hyp.max_after_balance_size AS xr_max_after_balance_size,
 dbo.xrt_hyp.max_confusion_matrix_size AS xr_max_confusion_matrix_size,

 dbo.xrt_hyp.max_depth AS xr_max_depth, dbo.xrt_hyp.max_hit_ratio_k AS
 xr_max_hit_ratio_k, dbo.xrt_hyp.max_runtime_secs AS xr_max_runtime_secs, dbo.xrt_hyp.min_rows
 AS xr_min_rows, dbo.xrt_hyp.min_split_improvement AS xr_min_split_improvement,

 dbo.xrt_hyp.model_id AS xr_model_id, dbo.xrt_hyp.mtries AS xr_mtries,
 dbo.xrt_hyp.nbins AS xr_nbins, dbo.xrt_hyp.nbins_cats AS xr_nbins_cats, dbo.xrt_hyp.nbins_top_level
 AS xr_nbins_top_level, dbo.xrt_hyp.nfolds AS xr_nfolds,

 dbo.xrt_hyp.ntrees AS xr_ntrees, dbo.xrt_hyp.offset_column AS xr_offset_column,
 dbo.xrt_hyp.r2_stopping AS xr_r2_stopping, dbo.xrt_hyp.response_column AS xr_response_column,
 dbo.xrt_hyp.weights_column AS xr_weights_column,

 dbo.xrt_hyp.validation_frame AS xr_validation_frame, dbo.xrt_hyp.stopping_rounds,
 dbo.xrt_hyp.score_tree_interval AS xr_score_tree_interval, dbo.xrt_hyp.score_each_iteration AS
 xr_score_each_iteration, dbo.xrt_hyp.sample_rate_per_class AS xr_sample_rate_per_class,

 dbo.xrt_hyp.sample_rate AS xr_sample_rate

 FROM dbo.leaderboard Full JOIN

 dbo.gbm_hyp ON dbo.leaderboard.model_id = dbo.gbm_hyp.model_id Full JOIN

 dbo.randomForest_hyp ON dbo.leaderboard.model_id = dbo.randomForest_hyp.model_id
 full JOIN

```

dbo.xrt_hyp ON dbo.leaderboard.model_id = dbo.xrt_hyp.model_id

WHERE dbo.leaderboard.model_id like '%GBM%' OR
dbo.leaderboard.model_id like '%XRT%'

OR dbo.leaderboard.model_id like '%DRF%'

AND dbo.gbm_hyp.nbins_cats >= 0 and
dbo.gbm_hyp.nbins_cats <=2000

AND dbo.xrt_hyp.ntrees >= 20

AND dbo.xrt_hyp.min_split_improvement >= 1e-10 and
dbo.xrt_hyp.min_split_improvement <= 1e-3

AND dbo.randomForest_hyp.categorical_encoding in
('AUTO', 'Enum', 'EnumLimited', 'OneHotExplicit','Eigen', 'LabelEncoder', 'SortByResponse')

```

GO

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists various database objects such as Columns, Keys, Constraints, Triggers, Indexes, Views, and Stored Procedures. The central pane displays a query results grid for a SELECT statement. The grid has columns for runtime_secs, min_rows, min_split_improvement, model_id, monotone_constraints, nbins, nbins_cats, nbins_top_level, nfolds, and ntree. The data shows 12 rows of results, each corresponding to a different model ID and its parameters.

	runtime_secs	min_rows	min_split_improvement	model_id	monotone_constraints	nbins	nbins_cats	nbins_top_level	nfolds	ntree
1	10	1E-05	GBM_1_AutoML_20190420_135144	NULL	20	1024	1024	0	50	50
2	100	1E-05	GBM_1_AutoML_20190420_135144	NULL	20	1024	1024	5	65	65
3	10	1E-05	GBM_2_AutoML_20190420_151756	NULL	20	1024	1024	0	50	50
4	100	1E-05	GBM_2_AutoML_20190420_151756	NULL	20	1024	1024	5	63	63
5	10	1E-05	GBM_2_AutoML_20190420_162320	NULL	20	1024	1024	0	50	50
6	100	1E-05	GBM_2_AutoML_20190420_162320	NULL	20	1024	1024	5	64	64
7	LL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NL
8	LL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NL
9	LL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NL

View5:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: View [dbo].[v_stack_lead]  Script Date: 4/25/2019 2:58:21 PM *****
```

```
SET ANSI_NULLS ON
```

```
GO
```

```
SET QUOTED_IDENTIFIER ON
```

```
GO
```

```
ALTER VIEW [dbo].[v_stack_lead]
```

```
AS
```

```
SELECT      dbo.leaderboard.model_id, dbo.leaderboard.auc, dbo.leaderboard.logloss,  
dbo.leaderboard.mean_per_class_error, dbo.leaderboard.rmse, dbo.leaderboard.mse,  
dbo.stackedEnsemble_hyp.base_models,
```

```
        dbo.stackedEnsemble_hyp.blending_frame,
```

```
dbo.stackedEnsemble_hyp.export_checkpoints_dir, dbo.stackedEnsemble_hyp.response_column,  
dbo.stackedEnsemble_hyp.model_id AS se_model_id,
```

```
        dbo.stackedEnsemble_hyp.metalearner_params,
```

```
dbo.stackedEnsemble_hyp.metalearner_nfolds, dbo.stackedEnsemble_hyp.metalearner_fold_column,  
dbo.stackedEnsemble_hyp.metalearner_fold_assignment,
```

```
        dbo.stackedEnsemble_hyp.metalearner_algorithm,
```

```
dbo.stackedEnsemble_hyp.keep_levelone_frame, dbo.stackedEnsemble_hyp.validation_frame
```

```
FROM      dbo.stackedEnsemble_hyp INNER JOIN
```

```
        dbo.leaderboard ON dbo.stackedEnsemble_hyp.model_id = dbo.leaderboard.model_id
```

```
        WHERE training_frame is not null
```

AND metalearner_nfolds >= 0

AND metalearner_algorithm in ('AUTO', 'glm', 'gbm',
'drf', 'deeplearning')

AND base_models is not null

GO

RESULT:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists various database objects like tables, views, and stored procedures. The central pane displays the results of a T-SQL query. The query itself is as follows:

```
SELECT
    [mse]
    ,[base_models]
    ,[blending_frame]
    ,[export_checkpoints_dir]
    ,[response_column]
    ,[se_model_id]
    ,[metalearner_params]
    ,[metalearner_nfolds]
    ,[metalearner_fold_column]
    ,[metalearner_fold_assignment]
    ,[metalearner_algorithm]
    ,[keep_levelone_frame]
    ,[validation_frame]
FROM [Hyperparameter_PK].[dbo].[v_stack_lead]
```

The results grid shows six rows of data, each representing a different model configuration. The columns include model_id, auc, gloss, mean_per_class_error, rmse, and mse. The data is as follows:

model_id	auc	gloss	mean_per_class_error	rmse	mse
1	0.9165588028671	0.31410496211009	0.179909310144358	0.311726541590557	0.097173436732
2	0.9165588028671	0.31410496211009	0.179909310144358	0.311726541590557	0.097173436732
3	0.916434601545767	0.314266869029281	0.180125407362866	0.31189831533566	0.097280559109
4	0.916434601545767	0.314266869029281	0.180125407362866	0.31189831533566	0.097280559109
5	0.915920603777968	0.315655796158604	0.18388153701369	0.312316401275908	0.097541534505
6	0.915920603777968	0.315655796158604	0.18388153701369	0.312316401275908	0.097541534505

At the bottom of the results pane, it says "Query executed successfully." The status bar at the bottom right shows the connection details: "is-swang01.ischool.uw.edu (78) | INFO6210 (78) | Hyperparameter_PK | 00:00:00 | 6 rows".

Index1:

USE [Hyperparameter_PK]

GO

***** Object: Index [ClusteredIndex-xr] Script Date: 4/25/2019 2:59:23 PM *****

DROP INDEX [ClusteredIndex-xr] ON [dbo].[xrt_hyp] WITH (ONLINE = OFF)

GO

***** Object: Index [ClusteredIndex-xr] Script Date: 4/25/2019 2:59:23 PM *****

```
CREATE CLUSTERED INDEX [ClusteredIndex-xr] ON [dbo].[xrt_hyp]
(
    [build_tree_one_node] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF, DROP_EXISTING = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
GO
```

Index 2:

```
USE [Hyperparamter_PK]
GO
```

```
***** Object: Index [ClusteredIndex-se]  Script Date: 4/25/2019 2:59:57 PM *****/
DROP INDEX [ClusteredIndex-se] ON [dbo].[stackedEnsemble_hyp] WITH ( ONLINE = OFF )
GO
```

```
SET ANSI_PADDING ON
GO
```

```
***** Object: Index [ClusteredIndex-se]  Script Date: 4/25/2019 2:59:57 PM *****/
CREATE CLUSTERED INDEX [ClusteredIndex-se] ON [dbo].[stackedEnsemble_hyp]
(
    [base_models] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF, DROP_EXISTING = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
GO
```

Index 3:

```
USE [Hyperparamter_PK]
GO
```

```
***** Object: Index [ClusteredIndex-rf]  Script Date: 4/25/2019 3:00:30 PM *****/
DROP INDEX [ClusteredIndex-rf] ON [dbo].[randomForest_hyp] WITH ( ONLINE = OFF )
GO
```

```
***** Object: Index [ClusteredIndex-rf]  Script Date: 4/25/2019 3:00:30 PM *****/
CREATE CLUSTERED INDEX [ClusteredIndex-rf] ON [dbo].[randomForest_hyp]
(
    [mtries] ASC,
    [ntrees] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF, DROP_EXISTING = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
GO
```

Index 4:

```
USE [Hyperparamter_PK]
GO
```

```
***** Object: Index [ClusteredIndex-md]  Script Date: 4/25/2019 3:00:54 PM *****/
DROP INDEX [ClusteredIndex-md] ON [dbo].[gbm_hyp] WITH ( ONLINE = OFF )
GO
```

```
***** Object: Index [ClusteredIndex-md]  Script Date: 4/25/2019 3:00:54 PM *****/
CREATE CLUSTERED INDEX [ClusteredIndex-md] ON [dbo].[gbm_hyp]
(
    [ntrees] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF, DROP_EXISTING = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
GO
```

Index 5:

```
USE [Hyperparamter_PK]
```

```
GO
```

```
***** Object: Index [ClusteredIndex-g1] Script Date: 4/25/2019 3:01:46 PM *****
```

```
DROP INDEX [ClusteredIndex-g1] ON [dbo].[glm_hyp] WITH ( ONLINE = OFF )
```

```
GO
```

```
SET ANSI_PADDING ON
```

```
GO
```

```
***** Object: Index [ClusteredIndex-g1] Script Date: 4/25/2019 3:01:46 PM *****
```

```
CREATE CLUSTERED INDEX [ClusteredIndex-g1] ON [dbo].[glm_hyp]
```

```
(
```

```
    [alpha] ASC
```

```
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF, DROP_EXISTING = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
```

```
GO
```

Use case 1:

```
--Find the Hyperparameters from GBM where number of trees are greater than 50 and  
distribution is either bernoulli or multinomial  
-- min_split_improvement between 1e-10 and 1e-3 and
```

```
SELECT  
    dbo.gbm_hyp.[checkpoint], dbo.gbm_hyp.class_sampling_factors,  
    dbo.gbm_hyp.col_sample_rate, dbo.gbm_hyp.col_sample_rate_change_per_level,  
    dbo.gbm_hyp.custom_metric_func, dbo.gbm_hyp.col_sample_rate_per_tree,  
    dbo.gbm_hyp.distribution, dbo.gbm_hyp.export_checkpoints_dir,  
    dbo.gbm_hyp.fold_assignment, dbo.gbm_hyp.fold_column,  
    dbo.gbm_hyp.histogram_type, dbo.gbm_hyp.huber_alpha,  
    dbo.gbm_hyp.ignore_const_cols,
```

```

        dbo.gbm_hyp.ignored_columns,    dbo.gbm_hyp.learn_rate,
        dbo.gbm_hyp.learn_rate_annealing,
dbo.gbm_hyp.max_abs_leafnode_pred,
        dbo.gbm_hyp.max_runtime_secs,    dbo.gbm_hyp.min_rows,
dbo.gbm_hyp.min_split_improvement,
                                dbo.gbm_hyp.model_id,
dbo.gbm_hyp.monotone_constraints, dbo.gbm_hyp.nbins,    dbo.gbm_hyp.nbins_cats,
                                dbo.gbm_hyp.nbins_top_level, dbo.gbm_hyp.nfolds,
dbo.gbm_hyp.ntrees,    dbo.gbm_hyp.offset_column,
                                dbo.gbm_hyp.pred_noise_bandwidth,
dbo.gbm_hyp.quantile_alpha,    dbo.gbm_hyp.r2_stopping,
                                dbo.gbm_hyp.response_column, dbo.gbm_hyp.sample_rate,
dbo.gbm_hyp.sample_rate_per_class, dbo.gbm_hyp.score_each_iteration,
dbo.gbm_hyp.score_tree_interval, dbo.gbm_hyp.tweedie_power,
                                dbo.gbm_hyp.weights_column, dbo.leaderboard.model_id AS Expr1

FROM      dbo.gbm_hyp INNER JOIN
          dbo.leaderboard ON dbo.gbm_hyp.model_id =
dbo.leaderboard.model_id
WHERE ntrees >= 50
AND distribution in ('bernoulli',
'multinomial')

AND min_split_improvement >= 1e-10 and
min_split_improvement <= 1e-3

```

The screenshot shows the Microsoft SQL Server Management Studio interface. In the top navigation bar, the title is "new use case.sql - ..._PK (INFO6210 (80)) - Microsoft SQL Server Management Studio". The menu items include File, Edit, View, Query, Project, Debug, Tools, Window, Help. Below the menu is a toolbar with various icons for file operations like Open, Save, Print, etc. The central area contains a query window with the following SQL code:

```

-- Find the Hyperparameters from GBM where number of trees are greater than 50 and distribution is either bernoulli or multinomial
-- min_split_improvement between 1e-10 and 1e-3 and
SELECT
    dbo.gbm_hyp.[checkpoint], dbo.gbm_hyp.class_sampling_factors, dbo.gbm_hyp.col_sample_rate,
    dbo.gbm_hyp.col_sample_rate_change_per_level, dbo.gbm_hyp.custom_metric_func,
    dbo.gbm_hyp.col_sample_rate_per_tree,
    dbo.gbm_hyp.distribution, dbo.gbm_hyp.export_checkpoints_dir, dbo.gbm_hyp.fold_assignment,
    dbo.gbm_hyp.fold_column, dbo.gbm_hyp.histogram_type, dbo.gbm_hyp.huber_alpha,
    dbo.gbm_hyp.ignore_const_cols,
    dbo.gbm_hyp.ignored_columns, dbo.gbm_hyp.learn_rate,
    dbo.gbm_hyp.learn_rate_annealing, dbo.gbm_hyp.max_abs_leafnode_pred,
    dbo.gbm_hyp.max_runtime_secs, dbo.gbm_hyp.min_rows, dbo.gbm_hyp.min_split_improvement,
    dbo.gbm_hyp.model_id, dbo.gbm_hyp.monotone_constraints, dbo.gbm_hyp.nbins, dbo.gbm_hyp.nbins_cats,
    dbo.gbm_hyp.nbins_top_level, dbo.gbm_hyp.nfolds, dbo.gbm_hyp.ntrees, dbo.gbm_hyp.offset_column,
    dbo.gbm_hyp.pred_noise_bandwidth, dbo.gbm_hyp.quantile_alpha, dbo.gbm_hyp.r2_stopping,
    dbo.gbm_hyp.response_column, dbo.gbm_hyp.sample_rate, dbo.gbm_hyp.sample_rate_per_class, dbo.gbm_hyp.score_each_iteration

```

The results grid below the query window displays the following data:

	[checkpoint]	class_sampling_factors	col_sample_rate	col_sample_rate_change_per_level	custom_metric_func	col_sample_rate_per_tree	distribution
1	NULL	NULL	0.8	1	NULL	0.8	bernoulli
2	NULL	NULL	0.8	1	NULL	0.8	bernoulli
3	NULL	NULL	0.8	1	NULL	0.8	bernoulli

The status bar at the bottom indicates "3 rows affected".

Use Case 2:

```
-- what are the metrics for stacked ensembling model where base models are present for every model_id
SELECT      dbo.leaderboard.model_id, dbo.leaderboard.auc, dbo.leaderboard.logloss,
dbo.leaderboard.mean_per_class_error, dbo.leaderboard.rmse, dbo.leaderboard.mse,
dbo.stackedEnsemble_hyp.base_models,
              dbo.stackedEnsemble_hyp.blending_frame,
dbo.stackedEnsemble_hyp.export_checkpoints_dir, dbo.stackedEnsemble_hyp.response_column,
dbo.stackedEnsemble_hyp.model_id AS se_model_id,
              dbo.stackedEnsemble_hyp.metalearner_params,
dbo.stackedEnsemble_hyp.metalearner_nfolds,
dbo.stackedEnsemble_hyp.metalearner_fold_column,
dbo.stackedEnsemble_hyp.metalearner_fold_assignment,
              dbo.stackedEnsemble_hyp.metalearner_algorithm,
dbo.stackedEnsemble_hyp.keep_levelone_frame, dbo.stackedEnsemble_hyp.validation_frame
FROM        dbo.stackedEnsemble_hyp INNER JOIN
              dbo.leaderboard ON dbo.stackedEnsemble_hyp.model_id =
dbo.leaderboard.model_id
              WHERE training_frame is not null
              AND metalearner_nfolds >= 0
              AND metalearner_algorithm in ('AUTO', 'glm'
, 'gbm', 'drf', 'deeplearning')
              AND base_models is not null
```

model_id	auc	logloss	mean_per_c
StackedEnsemble_BestOffamily_AutoML_20190420_158144	0.9165590282671	0.31410496211009	0.17909091
StackedEnsemble_BestOffamily_AutoML_20190420_158144	0.9165590282671	0.31410496211009	0.17909091
StackedEnsemble_BestOffamily_AutoML_20190420_151756	0.91644001548767	0.314240669029281	0.18012840
StackedEnsemble_BestOffamily_AutoML_20190420_151756	0.91644001548767	0.314240669029281	0.18012840
StackedEnsemble_BestOffamily_AutoML_20190420_162320	0.915920402777968	0.315655796155604	0.18288152
StackedEnsemble_BestOffamily_AutoML_20190420_162320	0.915920402777968	0.315655796155604	0.18288152

Query executed successfully.

Use Case 3:

```
--Compare the metrics and also find the common Hyperparamter for like models such GBM, RANDOM FOREST, XRT
```

```

SELECT
    ld.model_id
    ,auc
    ,logloss
    ,rmse
    ,gb.ntrees
    ,rf.ntrees
    ,xr.ntrees
    ,gb.fold_assignment
    ,xr.fold_assignment
    ,rf.fold_assignment
    ,GO

```

FROM

```

dbo.leaderboard ld Full JOIN
    dbo.gbm_hyp gb ON ld.model_id = gb.model_id Full JOIN
    dbo.randomForest_hyp rf ON ld.model_id = rf.model_id full JOIN
    dbo.xrt_hyp xr ON ld.model_id = xr.model_id

```

GO

model_id	auc	logloss	rmse	gb_ntrees	rf_ntrees	xr_ntrees	gb_fold_assignment	xr_fold_assignment	rf_fold_assignment
GBM_1_AutoML_20190420_162320	0.916711052220544	0.298812247408997	0.30827402						
GBM_grid_1_AutoML_20190420_125144_model_1	0.599794051320119	0.223267214122897	0.32414995						
GBM_grid_1_AutoML_20190420_151786_model_1	0.899794051320119	0.223267214122897	0.32414995						
GBM_grid_1_AutoML_20190420_162320_model_1	0.898853947442283	0.32968211573548	0.32440035						
StackedEnsemble_BestOfFamily_AutoML_20190420_135144	0.9165593028671	0.31410496211009	0.31172654						
StackedEnsemble_BestOfFamily_AutoML_20190420_151786	0.9165593028671	0.31410496211009	0.31172654						
StackedEnsemble_BestOfFamily_1_AutoML_20190420_162320	0.9159204037968	0.315457946156404	0.31231440						
XRT_1_AutoML_20190420_135144	0.902221751594601	0.33281503850849	0.31516982						
XRT_1_AutoML_20190420_135144	0.902221751594601	0.33281503850849	0.31516982						
XRT_1_AutoML_20190420_151786	0.90747211774447	0.31408923579886	0.31516982						
XRT_1_AutoML_20190420_162320	0.90747211774447	0.31408923579886	0.31516982						
XRT_1_AutoML_20190420_162320	0.905566770506558	0.316571414266627	0.31533460						
XRT_1_AutoML_20190420_162320	0.905566770506558	0.316571414266627	0.31533460						

Use case 4:

-- Selecting best DRF and GLM , Deeplearning, XRT, Stacked Ensemble, GBM model

```

SELECT
    model_id
    ,max(auc) as Maximum_auc

```

```

FROM [Hyperparameter_PK].[dbo].[leaderboard] WHERE
model_id like '%GBM%'

```

```

or model_id like '%Deep%'
or model_id like '%DRF%'
or model_id like '%GLM%'
OR model_id like '%XRT%'
or model_id like '%ST%'
GROUP BY model_id

```

The screenshot shows the Microsoft SQL Server Management Studio interface. In the Object Explorer, there are several database objects under the 'dbo' schema, including 'gbm_hyp', 'glm_hyp', 'leaderboard', 'meta_data', 'predictions', and 'randomForest_hyp'. The 'leaderboard' table is selected in the current session. A query is running in the center pane:

```

-- Selecting best DRF and GLM , Deeplearning, XRT, Stacked Ensemble, GBH model
SELECT
    model_id
    ,max(auc) as Maximum_auc
FROM [Hyperparameter_PK].[dbo].[leaderboard] WHERE
model_id like '%GBH%'
or model_id like '%Deep%'
or model_id like '%DRF%'
or model_id like '%GLM%'
or model_id like '%XRT%'
or model_id like '%ST%'
GROUP BY model_id

```

The results pane displays the following data:

model_id	Maximum_auc
DeepLearning_1_AutoML_20190420_135144	0.90472327040788
DeepLearning_1_AutoML_20190420_162320	0.90431721992066
DeepLearning_gnd_1_AutoML_20190420_151756_model_3	0.907720568029672
DRF_1_AutoML_20190420_135144	0.905731517214873
DRF_1_AutoML_20190420_151756	0.905536565484867
DRF_1_AutoML_20190420_162320	0.903222960036995
GBM_1_AutoML_20190420_135144	0.917522532993048
GBM_2_AutoML_20190420_151756	0.917524893490608
GBM_2_AutoML_20190420_162320	0.91677130520544
GLM_gnd_1_AutoML_20190420_135144 model_1	0.899784051320119

At the bottom of the screen, the taskbar shows the system status and the date and time.

Use Case 2:

```

--Range of Hyperparameter and othe parameters for GBM
SELECT DISTINCT gb.model_id, auc, logloss, ntrees , min_split_improvement ,
col_sample_rate, distribution, fold_assignment,
keep_cross_validation_models, keep_cross_validation_predictions, max_depth, min_rows,
nbins, nbins_cats,
nfolds, quantile_alpha, stopping_metric, stopping_rounds, stopping_tolerance,
tweedie_power

FROM      dbo.gbm_hyp gb INNER JOIN
          dbo.leaderboard ld ON gb.model_id = ld.model_id

```

Usercase-2.sql - is-swang01.ischool.uw.edu.Hyperparameter_PK (INFO6210 (84)) - Microsoft SQL Server Management Studio

File Edit View Query Project Debug Tools Window Help

Hyperparameter_PK Execute Debug

Object Explorer

USE-case-5.sql - is_r_PK (INFO6210 (85)) USEcase-2.sql - is_r_PK (INFO6210 (84)) USEcase-4.sql - is_r_PK (INFO6210 (83))

```

--Range of hyperparameter and other parameters for GBM
SELECT DISTINCT gb_model_id, auc, logloss, ntrees, min_split_improvement, col_sample_rate, distribution, fold_assignment,
keep_cross_validation_models, keep_cross_validation_predictions, max_depth, min_rows, nbins, nbins_cats,
nfolds, quantile_alpha, stopping_metric, stopping_rounds, stopping_tolerance, tweedie_power
FROM      dbo.gbm_hyp gb
INNER JOIN dbo.leaderboard ld ON gb.model_id = ld.model_id

```

Results

model_id	auc	logloss	ntrees	min_split_improvement	col_sample_rate	di...
GBM_1_AutoML_20190420_135144	0.917522532990048	0.297859095153619	50	1E-05	1	AU...
GBM_1_AutoML_20190420_135144	0.917522532990048	0.297859095153619	65	1E-05	0.8	be...
GBM_2_AutoML_20190420_151756	0.9175245934904608	0.297747009185315	50	1E-05	1	AS...
GBM_2_AutoML_20190420_151756	0.9175245934904608	0.297747009185315	65	1E-05	0.8	be...
GBM_2_AutoML_20190420_162320	0.916771305220544	0.298813294705897	50	1E-05	1	AU...
GBM_2_AutoML_20190420_162320	0.916771305220544	0.298813294705897	64	1E-05	0.8	be...

(6 rows affected)

Query executed successfully.

is-swang01.ischool.uw.edu (INFO6210 (84)) Hyperparameter_PK 00:00:00 6 rows

Ln 7 Col 73 Ch 73 INS

ENG IN 3:08 PM 4/25/2019