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SAS® Customer Link Analytics 5.5

Data Reference Guide

SAS® Documentation

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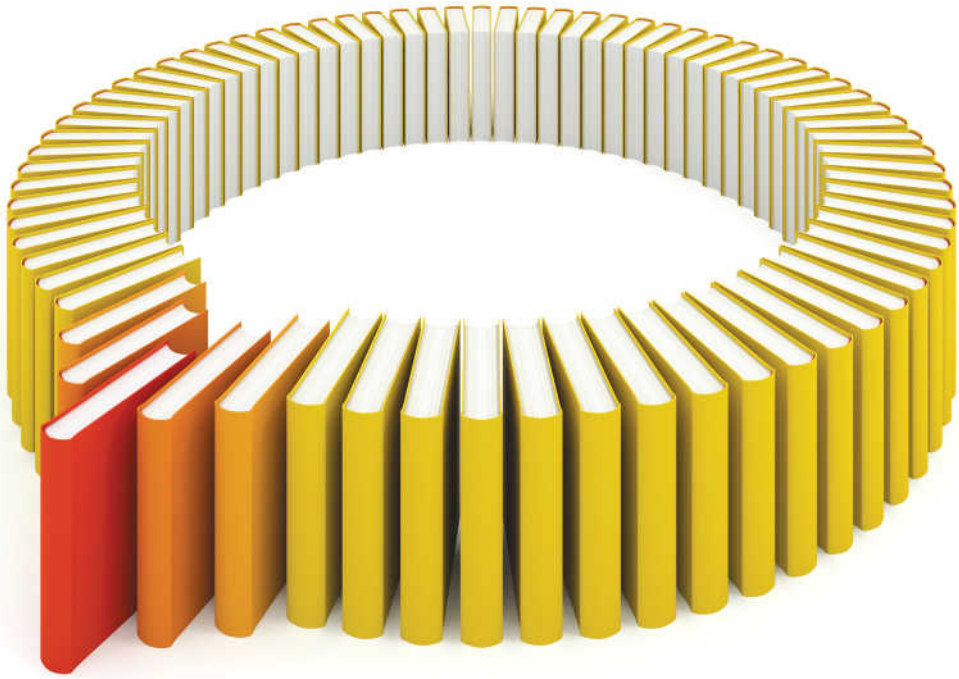

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Part 1

Introduction

Chapter 1

Introduction to the Data Reference Guide

About the Data Reference Guide

This document contains the following parts:

Physical Data Model Diagrams
: This section gives the physical data model diagrams for SAS Customer Link Analytics.

Data Dictionary
: This section lists the application data tables and their columns. It also gives a list of business data tables and analytical variables.

Classification of Tables

The SAS Customer Link Analytics tables are classified as mentioned below:

Application data
: stores project-specific data and configuration details of source data. Also, stores the results that the SAS Customer Link Analytics solution produces when each workflow step is run. These results include information about communities, roles, and centrality measures.

Business data
: store the intermediate tables that SAS Customer Link Analytics creates when the workflow steps are run. Also, contains the final output that SAS Customer Link Analytics produces when all the workflow steps of a project are run. This output includes node-level information such as role ID, community ID, and centrality values. In addition, business data contains reporting data that SAS Customer Link Analytics can produce in the format that can be further exploited by reporting tools such as SAS Visual Analytics to build certain meaningful reports.

Part 2

Data Model Diagrams

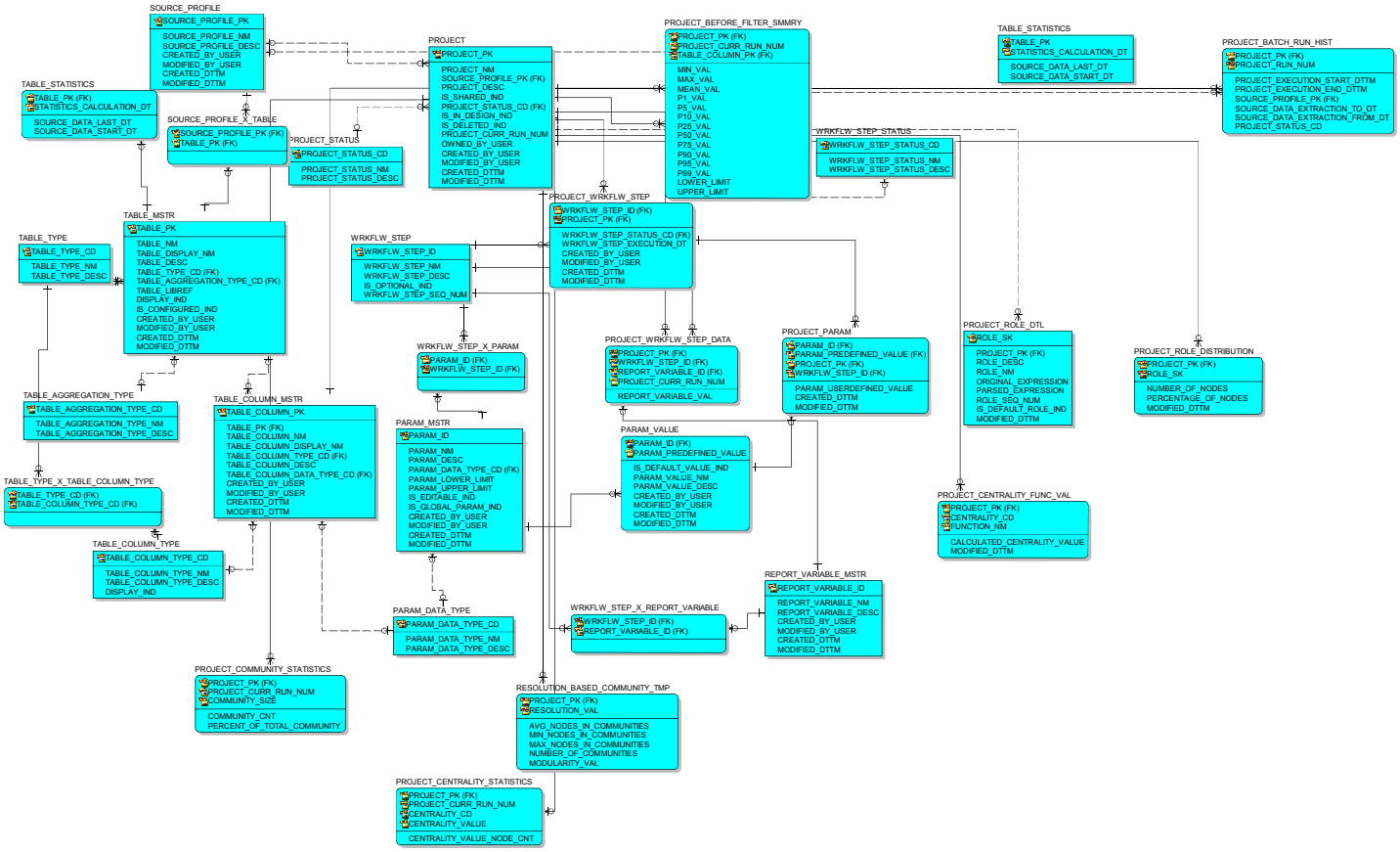
Chapter 2

Physical Data Model Diagram for Project-Specific Tables

Project-Specific Application Data Tables

The physical data model diagram for the project-specific application data tables is shown on the next page.

SAS® Customer Link Analytics 5.5: Application Data Tables

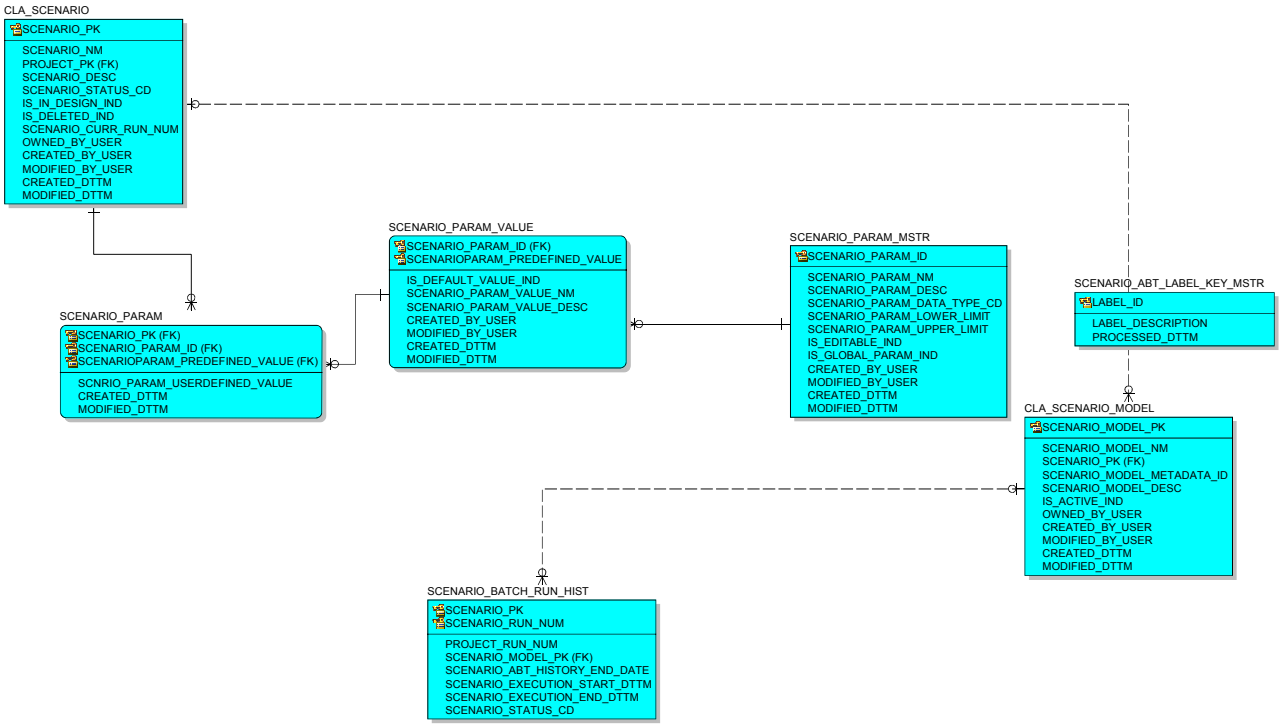


Chapter 3

Physical Data Model Diagram for Scenario-Specific Tables

Scenario-Specific Application Data Tables

The physical data model diagram for the scenario-specific application data tables is shown on the next page.



Part 3

Data Dictionary

Chapter 4

Application Data Tables

Descriptions of Application Data Tables

Table 4.1 *Project-Specific Tables*

Table Name	Table Description
PARAM_DATA_TYPE	Reference table for the parameter data type such as Date and Number.
PARAM_MSTR	Master table that stores all the parameters that SAS Customer Link Analytics uses for executing various processes. This table contains system-specific and user-specified parameters.
PARAM_VALUE	Stores the possible values that a parameter can have. This table also indicates the default value of a parameter.
PROJECT	Master table for storing project details. When a project is created, a record is added in this table.
PROJECT_BATCH_RUN_HIST	Captures historical information about the batch run of a particular project.
PROJECT_BEFORE_FILTER_SMMRY	Contains summary of source (transaction) data before the rule that is specified in the Link and Node filtering workflow step is applied to the data. This table is an input for the Link and Node Filtering page.
PROJECT_CENTRALITY_FUNC_VAL	Captures the function that is used on a centrality measure to assign a role to a node.
PROJECT_CENTRALITY_STATISTICS	Stores the results that are produced by the Centrality Measures Computation workflow step. This data is used to display the graph in the Centrality Measure Computation workflow step page. The graph indicates how many nodes have a particular centrality measure value.

Table Name	Table Description
PROJECT_COMMUNITY_STATISTICS	Stores the results that are produced by the Community Building workflow step. This data is used to generate the graph and the diameter summary results that are displayed on the **Results** tab of the Community Building workflow step.
PROJECT_PARAM	Parameter value that a user selects in a particular project is captured in this table.
PROJECT_ROLE_DISTRIBUTION	Input for the report that is displayed on the **Results** tab of the Role Assignment workflow step. The data in this table indicates how many nodes have a particular role.
PROJECT_ROLE_DTL	Stores the expressions that are used to define roles in the Role Assignment workflow step.
PROJECT_STATUS	Stores the reference data for the project status.
PROJECT_WRKFLW_STEP	Stores the execution status of each workflow step.
PROJECT_WRKFLW_STEP_DATA	Stores the value of report variables that are displayed in each workflow step.
REPORT_VARIABLE_MSTR	Stores the master list of reporting variables that are available for application reporting.
RESOLUTION_BASED_COMMUNITY_TMP	Stores the summary data when multiple values are used in a resolution list in the Community Building workflow step.
SOURCE_PROFILE	Collection of all tables that are used in a project.
SOURCE_PROFILE_X_TABLE	Association table of the source data profiles and source tables.
TABLE_AGGREGATION_TYPE	Reference data for the type of the aggregation that is supported in source data. For example, aggregation type can be monthly or fully.
TABLE_COLUMN_MSTR	List of columns present in the table. In this case, a record for the table should be available in the Table master.
TABLE_COLUMN_TYPE	Reference table for the different type of columns. For example, column types can be dimension, from ID, To ID, date, and measure.
TABLE_MSTR	Master table to capture the metadata of table such as a source call detail record (CDR) table that is used in a SAS Customer Link Analytics process.
TABLE_STATISTICS	Stores the statistics of source table. For example, date range for the data available in source table is stored in this table.

Table Name	Table Description
TABLE_TYPE	Reference table for the type of table. For example, the table type can be Transaction, Node attribute, Link attribute, Node inclusion list, and Link inclusion list.
TABLE_TYPE_X_TABLE_COLUMN_TYPE	Association table that indicates the column types that are supported in a particular table type.
WRKFLW_STEP	Reference table for workflow step that each project has in a SAS Customer Link Analytics workflow.
WRKFLW_STEP_STATUS	Reference table for the different statuses that are applicable for a workflow step.
WRKFLW_STEP_X_PARAM	Reference list for parameters that are defined a workflow step.
WRKFLW_STEP_X_REPORT_VARIABLE	Reference list for reports that are defined in a workflow step.

Table 4.2 *Scenario-Specific Tables*

Table Name	Table Description
CLA_SCENARIO	Master table for scenario definition. When a user defines a scenario for a particular project, a record is added in this table.
CLA_SCENARIO_MODEL	Master table that stores information about the analytical model that SAS Rapid Predictive Modeler creates for a scenario.
SCENARIO_ABT_LABEL_KEY_MSTR	Master table that stores the value of key and description. This information is used to generate meaningful labels for the columns of the scenario ABT.
SCENARIO_BATCH_RUN_HIST	Stores historical information about the batch run of a particular scenario.
SCENARIO_PARAM	Stores parameter values that a user has selected in a particular scenario.
SCENARIO_PARAM_MSTR	Master table that stores all the parameters that are used for processing scenarios. This table contains system-specific and user-specified parameters.
SCENARIO_PARAM_VALUE	Stores the possible values that a scenario-related parameter can have. This table also indicates the default value of a parameter.

Chapter 5

Column Descriptions of Application Data Tables

Column Descriptions of Project-Specific Tables

Table 5.1 *PARAM_DATA_TYPE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
PARAM_DATA_TYPE_CD	Code that is assigned to a parameter data type. For example, the data type can be Date, Number, and so on.	VARCHAR(10)	NOT NULL	Yes
PARAM_DATA_TYPE_DESC	Description of a parameter data type. For example, the data type can be Date, Number, and so on.	VARCHAR(100)	NULL	No
PARAM_DATA_TYPE_NM	Name of a parameter data type. For example, the data type can be Date, Number, and so on.	VARCHAR(40)	NULL	No

Table 5.2 *PARAM_MSTR Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_EDITABLE_IND	Indicates whether the parameter is editable.	CHAR(1)	NULL	No
IS_GLOBAL_PARAM_IND	Indicates whether the parameter is a global parameter.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
PARAM_DATA_TYPE_CD	Code that is assigned to a parameter data type. For example, the data type can be Date, Number, and so on.	VARCHAR(10)	NULL	No
PARAM_DESC	Description of the parameter.	VARCHAR(100)	NULL	No
PARAM_ID	Unique identifier of the parameter.	VARCHAR(32)	NOT NULL	Yes
PARAM_LOWER_LIMIT	Lower limit of the parameter.	NUMERIC(15,3)	NULL	No
PARAM_NM	Name of the parameter.	VARCHAR(40)	NULL	No
PARAM_UPPER_LIMIT	Upper limit of the parameter.	NUMERIC(15,3)	NULL	No

Table 5.3 *PARAM_VALUE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_DEFAULT_VALUE_IND	Indicates whether the parameter value is default.	CHAR(1)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
PARAM_ID	Unique identifier of the parameter.	VARCHAR(32)	NOT NULL	Yes
PARAM_PREDEFINED_VALUE	Predefined value of the parameter.	VARCHAR(100)	NOT NULL	Yes
PARAM_VALUE_DESC	Description of the parameter value.	VARCHAR(100)	NULL	No
PARAM_VALUE_NM	Name for the parameter value.	VARCHAR(40)	NULL	No

Table 5.4 *PROJECT Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_DELETED_IND	Indicates whether the project is deleted.	CHAR(1)	NULL	No
IS_IN_DESIGN_IND	Indicates whether the scenario is in design or batch mode.	CHAR(1)	NULL	No
IS_SHARED_IND	Indicates whether the project is shared.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
OWNED_BY_USER	User ID of the owner of the project.	VARCHAR(100)	NULL	No
PROJECT_CURR_RUN_NUM	Current run number of the project.	NUMERIC(10)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
PROJECT_DESC	Description of the project that a user has specified.	VARCHAR(200)	NULL	No
PROJECT_NM	Name that a user has specified for a project.	VARCHAR(40)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	SERIAL	NOT NULL	Yes
PROJECT_STATUS_CD	A code that is assigned for the project status.	VARCHAR(10)	NULL	No
SOURCE_PROFILE_PK	A sequence number that is generated for the source profile.	INTEGER	NULL	No

Table 5.5 *PROJECT_BATCH_RUN_HIST Table*

Column Name	Column Description	Data Type	Null Option	Is PK
PROJECT_EXECUTION_START_DTTM	The start date of project execution.	TIMESTAMP	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
PROJECT_RUN_NUM	Run number of the project.	NUMERIC(10)	NOT NULL	Yes
PROJECT_STATUS_CD	A code that is assigned for the project status.	VARCHAR(10)	NULL	No
SOURCE_DATA_EXTRACTION_FROM_DT	End date for extracting data from the source data.	TIMESTAMP(0)	NULL	No
SOURCE_DATA_EXTRACTION_TO_DT	Start date for extracting data from the source data.	TIMESTAMP(0)	NULL	No
SOURCE_PROFILE_PK	A sequence number that is generated for the source profile.	INTEGER	NULL	No

Table 5.6 *PROJECT_BEFORE_FILTER_SMMRY Table*

Column Name	Column Description	Data Type	Null Option	Is PK
LOWER_LIMIT	Lower limit for filtering links and nodes.	NUMERIC(15,3)	NULL	No
MAX_VAL	The maximum value of the measure.	NUMERIC(15,3)	NULL	No
MEAN_VAL	The mean value of the measure.	NUMERIC(15,3)	NULL	No
MIN_VAL	The minimum value of the measure.	NUMERIC(15,3)	NULL	No
P1_VAL	One percentile value of the measure.	NUMERIC(15,3)	NULL	No
P10_VAL	10 percentile value of the measure	NUMERIC(15,3)	NULL	No
P25_VAL	25 percentile value of the measure.	NUMERIC(15,3)	NULL	No
P5_VAL	Five percentile value of the measure.	NUMERIC(15,3)	NULL	No
P50_VAL	50 percentile value of the measure.	NUMERIC(15,3)	NULL	No
P75_VAL	75 percentile value of the measure.	NUMERIC(15,3)	NULL	No
P90_VAL	90 percentile value of the measure.	NUMERIC(15,3)	NULL	No
P95_VAL	95 percentile value of the measure.	NUMERIC(15,3)	NULL	No
P99_VAL	99 percentile value of the measure.	NUMERIC(15,3)	NULL	No
PROJECT_CURR_RUN_NUM	Current run number of the project.	NUMERIC(10)	NOT NULL	Yes
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
TABLE_COLUMN_PK	A sequence number that is generated for a table registered in SAS Customer Link Analytics.	INTEGER	NOT NULL	Yes

Column Name	Column Description	Data Type	Null Option	Is PK
UPPER_LIMIT	Upper limit for filtering links and nodes.	NUMERIC(15,3)	NULL	No

Table 5.7 *PROJECT_CENTRALITY_FUNC_VAL Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CALCULATED_CENTRALITY_VALUE	Calculated value of centrality	NUMERIC(15,3)	NULL	No
CENTRALITY_CD	A unique code that is assigned to the centrality measure.	VARCHAR(10)	NOT NULL	Yes
FUNCTION_NM	Name of the function that is applied on the centrality .	VARCHAR(40)	NOT NULL	Yes
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes

Table 5.8 *PROJECT_CENTRALITY_STATISTICS Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CENTRALITY_CD	A unique code that is assigned to the centrality measure.	VARCHAR(10)	NOT NULL	Yes
CENTRALITY_VALUE	Value of the centrality measure.	NUMERIC(8,2)	NOT NULL	Yes
CENTRALITY_VALUE_NODE_CNT	Number of nodes for a particular centrality value.	NUMERIC(6)	NULL	No
PROJECT_CURR_RUN_NUM	Current run number of the project.	NUMERIC(10)	NOT NULL	Yes
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes

Table 5.9 *PROJECT_COMMUNITY_STATISTICS Table*

Column Name	Column Description	Data Type	Null Option	Is PK
COMMUNITY_CNT	Number of communities that have a particular size.	NUMERIC(6)	NULL	No
COMMUNITY_SIZE	Size of the community. It indicates the number of nodes in a community.	NUMERIC(10)	NOT NULL	Yes
PERCENT_OF_TOTAL_COMMUNITY	Percentage of community out of total community	NUMERIC(9,4)	NOT NULL	No
PROJECT_CURR_RUN_NUM	Current run number of the project.	NUMERIC(10)	NOT NULL	Yes
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes

Table 5.10 *PROJECT_PARAM Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
PARAM_ID	Unique identifier of the parameter.	VARCHAR(32)	NOT NULL	Yes
PARAM_PREDEFINED_VALUE	Predefined value of the parameter.	VARCHAR(100)	NOT NULL	Yes
PARAM_USERDEFINED_VALUE	User-defined value of the parameter.	VARCHAR(100)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
WRKFLW_STEP_ID	Unique identifier of the workflow step	VARCHAR(32)	NOT NULL	Yes

Table 5.11 *PROJECT_ROLE_DISTRIBUTION Table*

Column Name	Column Description	Data Type	Null Option	Is PK
NUMBER_OF_NODES	The number of nodes that have a particular role.	NUMERIC(10)	NULL	No
PERCENTAGE_OF_NODES	Percentage of nodes that a particular role to the total number of nodes.	NUMERIC(9,4)	NOT NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
ROLE_SK	A sequence number that is generated for the role.	INTEGER	NOT NULL	Yes

Table 5.12 *PROJECT_ROLE_DTL Table*

Column Name	Column Description	Data Type	Null Option	Is PK
IS_DEFAULT_ROLE_IND	Indicates whether this is a default role.	CHAR(1)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
ORIGINAL_EXPRESSION	The expression that a user has created for role definition.	VARCHAR(1000)	NULL	No
PARSED_EXPRESSION	Expression that a user creates for a role definition.	VARCHAR(1000)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	No
ROLE_DESC	Description of the role that a user specifies in a role definition.	VARCHAR(100)	NULL	No
ROLE_NM	Name of the role that a user specifies in a role definition.	VARCHAR(40)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
ROLE_SEQ_NUM	Sequence number that indicates the priority of a role.	INTEGER	NOT NULL	No
ROLE_SK	A sequence number that is generated for the role.	SERIAL	NOT NULL	Yes

Table 5.13 *PROJECT_STATUS Table*

Column Name	Column Description	Data Type	Null Option	Is PK
PROJECT_STATUS_CD	A code that is assigned for the project status.	VARCHAR(10)	NOT NULL	Yes
PROJECT_STATUS_DESC	Description of the status.	VARCHAR(100)	NULL	No
PROJECT_STATUS_NM	Name of the project status.	VARCHAR(40)	NULL	No

Table 5.14 *PROJECT_WRKFLW_STEP Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
WRKFLW_STEP_EXECUTION_DT	Execution date of the workflow step.	TIMESTAMP(0)	NULL	No
WRKFLW_STEP_ID	Unique identifier of the workflow step	VARCHAR(32)	NOT NULL	Yes

Column Name	Column Description	Data Type	Null Option	Is PK
WRKFLW_STEP_STATUS_CD	Code that is assigned for the workflow step status.	VARCHAR(10)	NULL	No

Table 5.15 *PROJECT_WRKFLW_STEP_DATA Table*

Column Name	Column Description	Data Type	Null Option	Is PK
PROJECT_CURR_RUN_NUM	Current run number of the project.	NUMERIC(10)	NOT NULL	Yes
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
REPORT_VARIABLE_ID	Unique identifier of the report variable.	VARCHAR(32)	NOT NULL	Yes
REPORT_VARIABLE_VAL	Value of the reporting variable.	NUMERIC(15,3)	NULL	No
WRKFLW_STEP_ID	Unique identifier of the workflow step	VARCHAR(32)	NOT NULL	Yes

Table 5.16 *REPORT_VARIABLE_MSTR Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
REPORT_VARIABLE_DESC	Description of the reporting variable.	VARCHAR(100)	NULL	No
REPORT_VARIABLE_ID	Unique identifier of the report variable.	VARCHAR(32)	NOT NULL	Yes

Column Name	Column Description	Data Type	Null Option	Is PK
REPORT_VARIABLE_NM	Name of the reporting variable.	VARCHAR(40)	NULL	No

Table 5.17 *RESOLUTION_BASED_COMMUNITY_TMP Table*

Column Name	Column Description	Data Type	Null Option	Is PK
AVG_NODES_IN_COMMUNITIES	average nodes in community	NUMERIC(10)	NULL	No
MAX_NODES_IN_COMMUNITIES	The maximum number of nodes in a community.	NUMERIC(10)	NULL	No
MIN_NODES_IN_COMMUNITIES	The minimum number of nodes in a community.	NUMERIC(10)	NULL	No
MODULARITY_VAL	Modularity value .	NUMERIC(15,3)	NULL	No
NUMBER_OF_COMMUNITIES	Number of communities.	NUMERIC(10)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	Yes
RESOLUTION_VAL	value of the resolution list .	NUMERIC(20,8)	NOT NULL	Yes

Table 5.18 *SOURCE_PROFILE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
SOURCE_PROFILE_DESC	Description of source profile that is specified by the user.	VARCHAR(100)	NULL	No
SOURCE_PROFILE_NM	Name of the source profile that is specified by the user.	VARCHAR(40)	NULL	No
SOURCE_PROFILE_PK	A sequence number that is generated for the source profile.	SERIAL	NOT NULL	Yes

Table 5.19 *SOURCE_PROFILE_X_TABLE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
SOURCE_PROFILE_PK	A sequence number that is generated for the source profile.	INTEGER	NOT NULL	Yes
TABLE_PK	A sequence number that is generated for a table.	INTEGER	NOT NULL	Yes

Table 5.20 *TABLE_AGGREGATION_TYPE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
TABLE_AGGREGATION_TYPE_CD	A code that is assigned for the data aggregation level. For example, data can be monthly, daily, or fully aggregated.	VARCHAR(10)	NOT NULL	Yes
TABLE_AGGREGATION_TYPE_DESC	Description of data aggregation level. For example, data can be monthly, daily, or fully aggregated.	VARCHAR(100)	NULL	No
TABLE_AGGREGATION_TYPE_NM	Name of the data aggregation level . For example, data can be monthly, daily, or fully aggregated.	VARCHAR(40)	NULL	No

Table 5.21 *TABLE_COLUMN_MSTR Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
TABLE_COLUMN_DATA_TYPE_CD	Code that is assigned to a column data type. For example, column data type can Date, Number, and so on.	VARCHAR(10)	NULL	No
TABLE_COLUMN_DESC	Description of the table column.	VARCHAR(100)	NULL	No
TABLE_COLUMN_DISPLAY_NM	Display name of the column.	VARCHAR(40)	NULL	No
TABLE_COLUMN_NM	Name of the registered column.	VARCHAR(40)	NULL	No
TABLE_COLUMN_PK	A sequence number that is generated for a table registered in SAS Customer Link Analytics.	SERIAL	NOT NULL	Yes
TABLE_COLUMN_TYPE_CD	Code that is assigned for a column type. For example, column types can be dimension, from ID, To ID, date, and measure.	VARCHAR(10)	NULL	No
TABLE_PK	A sequence number that is generated for a table.	INTEGER	NOT NULL	No

Table 5.22 *TABLE_COLUMN_TYPE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
DISPLAY_IND	Indicates whether the column type is available for selection in the UI.	CHAR(1)	NULL	No
TABLE_COLUMN_TYPE_CD	Code that is assigned for a column type. For example, column types can be dimension, from ID, To ID, date, and measure.	VARCHAR(10)	NOT NULL	Yes
TABLE_COLUMN_TYPE_DESC	Description of the column type	VARCHAR(100)	NULL	No
TABLE_COLUMN_TYPE_NM	Name of the column type.	VARCHAR(40)	NULL	No

Table 5.23 *TABLE_MSTR Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
DISPLAY_IND	Indicates whether the table type is available for selection in the UI.	CHAR(1)	NULL	No
IS_CONFIGURED_IND	Indicates whether the table is completely configured.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
TABLE_AGGREGATION_TYPE_CD	A code that is assigned for the data aggregation level. For example, data can be monthly, daily, or fully aggregated.	VARCHAR(10)	NULL	No
TABLE_DESC	Description of the table as specified by the user.	VARCHAR(100)	NULL	No
TABLE_DISPLAY_NM	Display name of the table as specified by the user.	VARCHAR(40)	NULL	No
TABLE_LIBREF	Library reference of the table.	VARCHAR(10)	NULL	No
TABLE_NM	Name of the table that is registered in SAS Customer Link Analytics.	VARCHAR(40)	NULL	No
TABLE_PK	A sequence number that is generated for a table.	SERIAL	NOT NULL	Yes
TABLE_TYPE_CD	Code that is assigned for the type of table. For example, table types can be Transactional , Node attribute, Link attribute, Node inclusion list, and Link inclusion list.	VARCHAR(10)	NULL	No

Table 5.24 *TABLE_STATISTICS Table*

Column Name	Column Description	Data Type	Null Option	Is PK
SOURCE_DATA_LAST_DT	The latest date for which the data available in the source system.	TIMESTAMP(0)	NULL	No
SOURCE_DATA_LAST_DT	The latest date for which the data available in the source system.	TIMESTAMP(0)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
SOURCE_DATA_START_DT	The earliest date for which the data available in the source system.	TIMESTAMP(0)	NULL	No
SOURCE_DATA_START_DT	The earliest date for which the data available in the source system.	TIMESTAMP(0)	NULL	No
STATISTICS_CALCULATION_DT	The date on which statistics of the source table are calculated.	TIMESTAMP(0)	NOT NULL	Yes
STATISTICS_CALCULATION_DT	The date on which statistics of the source table are calculated.	TIMESTAMP(0)	NOT NULL	Yes
TABLE_PK	A sequence number that is generated for a table.	INTEGER	NOT NULL	Yes
TABLE_PK	A sequence number that is generated for a table.	INTEGER	NOT NULL	Yes

Table 5.25 *TABLE_TYPE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
TABLE_TYPE_CD	Code that is assigned for the type of table. For example, table types can be Transactional , Node attribute, Link attribute, Node inclusion list, and Link inclusion list.	VARCHAR(10)	NOT NULL	Yes
TABLE_TYPE_DESC	Description of the type of table. For example, table types can be Transactional , Node attribute, Link attribute, Node inclusion list, and Link inclusion list.	VARCHAR(100)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
TABLE_TYPE_NM	Name of the type of table. For example, table types can be Transactional , Node attribute, Link attribute, Node inclusion list, and Link inclusion list.	VARCHAR(40)	NULL	No

Table 5.26 *TABLE_TYPE_X_TABLE_COLUMN_TYPE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
TABLE_COLUMN_TYPE_CD	Code that is assigned for a column type. For example, column types can be dimension, from ID, To ID, date, and measure.	VARCHAR(10)	NOT NULL	Yes
TABLE_TYPE_CD	Code that is assigned for the type of table. For example, table types can be Transactional , Node attribute, Link attribute, Node inclusion list, and Link inclusion list.	VARCHAR(10)	NOT NULL	Yes

Table 5.27 *WRKFLW_STEP Table*

Column Name	Column Description	Data Type	Null Option	Is PK
IS_OPTIONAL_IND	Indicates whether the workflow step if optional.	CHAR(1)	NULL	No
WRKFLW_STEP_DESC	Description of the workflow step.	VARCHAR(100)	NULL	No
WRKFLW_STEP_ID	Unique identifier of the workflow step	VARCHAR(32)	NOT NULL	Yes
WRKFLW_STEP_NM	Name of the workflow step.	VARCHAR(40)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
WRKFLW_STEP_SEQ_NUM	The sequence in which the workflow steps are to be executed.	NUMERIC(10)	NULL	No

Table 5.28 *WRKFLW_STEP_STATUS Table*

Column Name	Column Description	Data Type	Null Option	Is PK
WRKFLW_STEP_STATUS_CD	Code that is assigned for the workflow step status.	VARCHAR(10)	NOT NULL	Yes
WRKFLW_STEP_STATUS_DESC	Description of the status of a workflow step.	VARCHAR(100)	NULL	No
WRKFLW_STEP_STATUS_NM	Name of the status of a workflow step.	VARCHAR(40)	NULL	No

Table 5.29 *WRKFLW_STEP_X_PARAM Table*

Column Name	Column Description	Data Type	Null Option	Is PK
PARAM_ID	Unique identifier of the parameter.	VARCHAR(32)	NOT NULL	Yes
WRKFLW_STEP_ID	Unique identifier of the workflow step	VARCHAR(32)	NOT NULL	Yes

Table 5.30 *WRKFLW_STEP_X_REPORT_VARIABLE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
REPORT_VARIABLE_ID	Unique identifier of the report variable.	VARCHAR(32)	NOT NULL	Yes
WRKFLW_STEP_ID	Unique identifier of the workflow step	VARCHAR(32)	NOT NULL	Yes

Column Descriptions of Scenario-Specific Tables

Table 5.31 *CLA_SCENARIO Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_DELETED_IND	Indicates whether the scenario is deleted.	CHAR(1)	NULL	No
IS_IN_DESIGN_IND	Indicates whether the scenario is in design or batch mode.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
OWNED_BY_USER	User ID of the owner of the scenario.	VARCHAR(100)	NULL	No
PROJECT_PK	A unique sequence number that is generated for a project.	INTEGER	NOT NULL	No
SCENARIO_CURR_RUN_NUM	Current run number of the scenario.	NUMERIC(10)	NULL	No
SCENARIO_DESC	Description of the scenario as specified by the user.	VARCHAR(200)	NULL	No
SCENARIO_NM	Name of the scenario as specified by the user	VARCHAR(40)	NULL	No
SCENARIO_PK	A sequence number that is generated for a scenario.	SERIAL	NOT NULL	Yes
SCENARIO_STATUS_CD	Code that is assigned for the scenario status.	VARCHAR(10)	NULL	No

Table 5.32 *CLA_SCENARIO_MODEL Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_ACTIVE_IND	Indicates whether the scenario model is active.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
OWNED_BY_USER	User ID of the owner of the scenario model.	VARCHAR(100)	NULL	No
SCENARIO_MODEL_DESC	Description of the scenario model.	VARCHAR(200)	NULL	No
SCENARIO_MODEL_METADATA_ID	Unique identifier for the scenario model. This value is fetched from the SAS metadata.	VARCHAR(32)	NOT NULL	No
SCENARIO_MODEL_NM	Name of the scenario model.	VARCHAR(40)	NOT NULL	No
SCENARIO_MODEL_PK	A unique sequence number that is generated for a model.	SERIAL	NOT NULL	Yes
SCENARIO_PK	A sequence number that is generated for a scenario.	INTEGER	NULL	No

Table 5.33 *SCENARIO_ABT_LABEL_KEY_MSTR Table*

Column Name	Column Description	Data Type	Null Option	Is PK
LABEL_DESCRIPTION	Description of the label.	VARCHAR(100)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
LABEL_ID	Unique identifier of the label.	VARCHAR(32)	NOT NULL	Yes
PROCESSED_DTTM	The date on which the record is processed.	TIMESTAMP(0)	NULL	No

Table 5.34 *SCENARIO_BATCH_RUN_HIST Table*

Column Name	Column Description	Data Type	Null Option	Is PK
PROJECT_RUN_NUM	Run number of the project.	NUMERIC(10)	NULL	No
SCENARIO_ABT_HISTORY_END_DATE	End date of the historical data in scenario ABT.	TIMESTAMP(0)	NULL	No
SCENARIO_EXECUTION_END_DTTM	End date of the scenario execution	TIMESTAMP	NULL	No
SCENARIO_EXECUTION_START_DTTM	Start date of the scenario execution.	TIMESTAMP	NULL	No
SCENARIO_MODEL_PK	A unique sequence number that is generated for a model.	INTEGER	NULL	No
SCENARIO_PK	A sequence number that is generated for a scenario.	INTEGER	NOT NULL	Yes
SCENARIO_RUN_NUM	Run number of the scenario.	NUMERIC(10)	NOT NULL	Yes
SCENARIO_STATUS_CD	Code that is assigned for the scenario status.	VARCHAR(10)	NULL	No

Table 5.35 *SCENARIO_PARAM Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
SCENARIO_PARAM_ID	Unique identifier of the scenario parameter.	VARCHAR(32)	NOT NULL	Yes
SCENARIO_PK	A sequence number that is generated for a scenario.	INTEGER	NOT NULL	Yes
SCENARIOPARAM_PREDEFINED_VALUE	Predefined value of the scenario parameter.	VARCHAR(250)	NOT NULL	Yes
SCNRIO_PARAM_USERDEFINED_VALUE	User-defined value of the scenario parameter.	VARCHAR(250)	NULL	No

Table 5.36 *SCENARIO_PARAM_MSTR Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_EDITABLE_IND	Indicates whether the parameter is editable.	CHAR(1)	NULL	No
IS_GLOBAL_PARAM_IND	Indicates whether the parameter is a global parameter.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
SCENARIO_PARAM_DATA_TYPE_CD	Code that is assigned for the data type of column. For example, the date type can be Date, Number, and so on.	VARCHAR(10)	NULL	No
SCENARIO_PARAM_DESC	Description of the scenario parameter.	VARCHAR(100)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
SCENARIO_PARAM_ID	Unique identifier of the scenario parameter.	VARCHAR(32)	NOT NULL	Yes
SCENARIO_PARAM_LOWER_LIMIT	The permissible lower limit for a scenario parameter value.	NUMERIC(15,3)	NULL	No
SCENARIO_PARAM_NM	Name of the parameter that is used in a scenario.	VARCHAR(40)	NULL	No
SCENARIO_PARAM_UPPER_LIMIT	The permissible upper limit for a scenario parameter value.	NUMERIC(15,3)	NULL	No

Table 5.37 *SCENARIO_PARAM_VALUE Table*

Column Name	Column Description	Data Type	Null Option	Is PK
CREATED_BY_USER	User ID of the user who created the record.	VARCHAR(100)	NULL	No
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NULL	No
IS_DEFAULT_VALUE_IND	Indicates whether the parameter value is default.	CHAR(1)	NULL	No
MODIFIED_BY_USER	User ID of the user who modified the record.	VARCHAR(100)	NULL	No
MODIFIED_DTTM	The date on which the record is modified.	TIMESTAMP(0)	NULL	No
SCENARIO_PARAM_ID	Unique identifier of the scenario parameter.	VARCHAR(32)	NOT NULL	Yes
SCENARIO_PARAM_VALUE_DESC	Description of the value of the scenario parameter.	VARCHAR(100)	NULL	No
SCENARIO_PARAM_VALUE_NM	Name of the value of the scenario parameter.	VARCHAR(40)	NULL	No

Column Name	Column Description	Data Type	Null Option	Is PK
SCENARIOPARAM_PREDEFINED_VALUE	Predefined value of the scenario parameter.	VARCHAR(250)	NOT NULL	Yes

Chapter 6

Business Data Tables

Business Data Tables

The results that are produced by each workflow step are stored in project-specific business data tables. A separate table is created for each project. Therefore, each table name includes the project ID, a sequence number that uniquely identifies each project.

Similarly, the output data of viral effect analysis is stored in scenario-specific table.

Table 6.1 *Project-Specific Business Data Tables*

Workflow Step	Table Name	Table Description
Data Extraction	cla_de_p1_<project ID>	Contains fully aggregated event detailed record (xDR) data.
	cla_de_p2_<project ID>	Contains degree-in and degree-out details for all nodes.
Link and Node Processing	cla_lnf_p1_<project ID>	Contains filtered directed graph xDR data with link weight
	cla_lnf_p2_<project ID>	Contains filtered undirected graph xDR data with link weight
	cla_lnf_p3_<project ID>	Contains filtered undirected reciprocal graph xDR data with link weight.

Workflow Step	Table Name	Table Description
Community Building	cla_cd_p1_<project ID>	Contains community ID of each node.
	cla_cd_p2_<project ID>	Contains links between communities.
	cla_cd_p3_<project ID>	Contains community information at different resolution levels.
	cla_cd_p4_<project ID>	Describes the intensity of each node that belongs to multiple communities.
	cla_cd_p5_<project ID>	Contains links within each community.
	cla_cd_p6_<project ID>	Contains filtered directed graph xDR data with link weight and community ID of each link.
Centrality Measures Computation	cla_cm_p1_<project ID>	Contains filtered undirected graph xDR with link weight and community ID of each link.
	cla_cm_p2_<project ID>	Contains centrality measures of all nodes with their community ID if centralities are computed by community.
Role Assignment	cla_ra_p1_	Contains centrality measures of all nodes with their roles and community ID if centralities are computed by community. This is the final output table of SAS Customer Link Analytics.

Table 6.2 *Scenario-Specific Business Data Table*

Table Name	Description
SCENARIO_SCORE_WRITEBACK	Stores history of scores that are predicted for a particular combination of model and scenario.

Table 6.3 *Columns of SCENARIO_SCORE_WRITEBACK Table*

Column Name	Column Description	Data Type	Null Option
CREATED_DTTM	The date on which the record is created.	TIMESTAMP(0)	NOT NULL
NODE_ID	A unique ID that is assigned to a node.	VARCHAR(32)	NOT NULL

Column Name	Column Description	Data Type	Null Option
SCENARIO_MODEL_PK	A unique sequence number that is generated for the model that is built for a scenario. This is the unique identifier of the model for which the scoring is performed.	INTEGER	NOT NULL
SCENARIO_PK	A sequence number that is generated for a scenario.	INTEGER	NOT NULL
SCENARIO_SCORE	Predicted scores of the event under consideration.	NUMERIC(17,3)	NOT NULL

Chapter 7

Analytical Variables

Analytical Variables

The analytical base table (ABT) that is built for viral effect analysis contains variables that are important for scenario analysis. These variables are called *analytical variables*. For more information about building an ABT and defining a scenario, see *SAS Customer Link Analytics: User's Guide*.

The analytical variables are generated depending on the business problem that you analyze through your scenario definition. Also, these variables are generated depending on how you have configured the workflow steps of the project that is associated with the scenario.

For example, the following table lists the analytical variables that are generated for analyzing the churn problem in the communications industry.

Table 7.1 *Analytical Variables*

Column Name	Column Description	Data Type	Column Type
NODE_ID	A unique value that identifies a node. This column is the grain of the model that is built.	Numeric	ID
ROLE_SK	A unique value that identifies a role. Roles are defined when the Role Assignment workflow step is run.	Numeric	Input
AUTHORITY_VAL	The value of Authority centrality measure for a node.	Numeric	Input
BETWEEN_VAL	The value of Betweenness centrality measure for a node.	Numeric	Input
CLOSE_VAL	The value of Closeness centrality measure for a node.	Numeric	Input
CLOSEIN_VAL	The value of Closeness-in centrality measure for a node.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
CLOSEOUT_VAL	The value of Closeness-out centrality measure for a node.	Numeric	Input
CLUSTCOEF_VAL	The value of Clustering coefficient for a node.	Numeric	Input
COMMUNITY_ID	The unique ID of the community to which a node belongs.	Numeric	Input
DEGREE_VAL	The value of Degree centrality measure for a node.	Numeric	Input
DEGREEIN_VAL	The value of Degree-in centrality measure for a node.	Numeric	Input
DEGREEOUT_VAL	The value of Degree-out centrality measure for a node.	Numeric	Input
EIGEN_VAL	The value of Eigenvector centrality measure for a node.	Numeric	Input
HUB_VAL	The value of Hub centrality measure for a node.	Numeric	Input
INFLUENCE1_VAL	The value of Influence 1 centrality measure for a node.	Numeric	Input
INFLUENCE2_VAL	The value of Influence 2 centrality measure for a node.	Numeric	Input
AGCMLVL_AUTHORITY_VAL	Average Authority centrality measure at community level. This variable is computed as the total of the Authority centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by the total number of nodes in that community.	Numeric	Input
AGCMLVL_BETWEEN_VAL	Average Betweenness centrality measure at community level. This variable is computed as the total of Betweenness centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_CLOSE_VAL	Average Closeness centrality measure at community level. This variable is computed as total of Closeness centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
AGCMLVL_CLOSEIN_VAL	Average In-closeness centrality measure at community level. This variable is computed as total of Closeness-in centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_CLOSEOUT_VAL	Average Out-closeness centrality measure at community level. This variable is computed as total of Out-closeness centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_CLUSTCOEF_VAL	Average Clustering coefficient centrality measure at community level. This variable is computed as total of Clustering coefficients of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_DEGREE_VAL	Average Degree centrality measure at community level. This variable is computed as total of Degree centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_DEGREEIN_VAL	Average In-degree centrality measure at community level. This variable is computed as total of In-degree centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_DEGREEOUT_VAL	Average Out-degree centrality measure at community level. This variable is computed as total of Out-degree centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
AGCMLVL_EIGEN_VAL	Average Eigenvector centrality measure at community level. This variable is computed as total of Eigenvector centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_HUB_VAL	Average Hub centrality measure at community level. This variable is computed as total of Hub centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_INFLUENCE 1_VAL	Average Influence 1 centrality measure at community level. This variable is computed as total of Influence 1 centrality measure of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_INFLUENCE 2_VAL	Average Influence 2 centrality measure at community level. This variable is computed as total of centrality measure Influence 2 of all the nodes that belong to the community to which the node under consideration belongs divided by total number of nodes in that community.	Numeric	Input
AGCMLVL_INC_MSR<j>	Average of incoming usage for measure *j* received by nodes that belong to the community to which the node under consideration belongs. This variable is computed at community level. If the node under consideration belongs to community *i*, then this variable is computed as the total of incoming usage for measure *j* received by all nodes that belong to community *i* divided by total number of nodes that belong to community *i*.	Numeric	Input
AGCMLVL_OUT_MSR<j>	Average of outgoing usage for measure *j* made by nodes that belong to the community to which the node under consideration belongs. This variable is computed at community level. If the node under consideration belongs to community *i*, then this variable is computed as total of outgoing usage for measure *j* made by all nodes that belongs to community *i* divided by total number of nodes that belong to community *i*.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
AVGINC_MSR<j>_RL<k>	Average of incoming usage for measure *j* received by nodes having role *k* that belong to the community to which the node under consideration belongs. This variable is computed at community level. If the node under consideration has a role *k* and belongs to community *i*, then this variable is computed as total of incoming usage for measure *j* received by all nodes having role *k* that belong to community *i* divided by total number of nodes having role *k* that belong to community *i*.	Numeric	Input
AVGOUT_MSR<j>_RL<k>	Average of outgoing usage for measure j made by nodes having role *k* that belong to the community to which the node under consideration belongs. This variable is computed at community level. If the node under consideration has a role *k* and belongs to community *i*, then this variable is computed as total of outgoing usage for measure *j* made by all nodes having role *k* that belong to community *i* divided by total number of nodes having role *k* that belong to community *i*.	Numeric	Input
DF_ND_COM_IN_MSR<j>	Absolute difference between the incoming usage for measure *j* received by the node under consideration and the average incoming usage for measure *j* at community level to which the node under consideration belongs. Average incoming usage for measure *j* is computed as: if the node under consideration belongs to community *i*, then the total incoming usage for measure *j* received by all the nodes belonging to community *i* divided by total number of nodes that belong to community *i*.	Numeric	Input
DF_ND_COM_OG_MSR<j>	Absolute difference between the outgoing usage for measure *j* made by node under consideration and the average outgoing usage for measure *j* at community level to which the node under consideration belongs. Average outgoing usage for measure *j* is computed as, if the node under consideration belongs to community *i*, then the total outgoing usage for measure *j* made by all the nodes belonging to community *i* divided by total number of nodes that belong to community *i*.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
MNDFICMR<j>_NDRL<k>	Minimum of absolute difference between the incoming usage for measure *j* received by node under consideration and the incoming usage for measure *j* received by nodes having role *k* that are connected to the node under consideration. To compute this variable: Compute the total incoming usage for measure *j* received by node under consideration. Compute the total incoming usage for measure *j* received by each of the nodes having role *k* that are connected to the node under consideration. Take absolute difference between incoming usage for measure *j* for node under consideration and incoming usage for measure *j* for each node having role *k* that is connected to the node under consideration. Take the minimum of this absolute difference.	Numeric	Input
MNDFOGMR<j>_NDRL<k>	Minimum of absolute difference between the outgoing usage for measure *j* made by node under consideration and the outgoing usage for measure *j* made by nodes having role *k* that are connected to the node under consideration. To compute this variable: Compute the total outgoing usage for measure *j* made by node under consideration. Compute the total outgoing usage for measure *j* made by each of the nodes having role *k* that are connected to the node under consideration. Take absolute difference between outgoing usage for measure *j* for node under consideration and outgoing usage for measure *j* for each node having role *k* that is connected to the node under consideration. Take the minimum of this absolute difference.	Numeric	Input
MNICMR<j>_FNCHRL<k>	The minimum incoming usage received by a node for measure *j* from all the connected non-churned nodes having role *k*. For example, this variable is computed as the minimum number of incoming SMS received by the node under consideration from all the non-churned nodes having role *k* that are connected to the node under consideration.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
MNICMR<j>_FRCHRL<k>	The minimum incoming usage received by a node for measure *j* from all the connected churned nodes having role *k*. For example, this variable computes the minimum number of incoming SMS received by the node under consideration from all the churned nodes having role *k* that are connected to the node under consideration.	Numeric	Input
MNIN_MSR<j>_FMRL<k>	The minimum incoming usage received by a node for measure *j* from all the connected nodes having role *k*. For example, this variable computes the minimum number of incoming SMS received by the node under consideration from all the nodes having role *k* that are connected to the node under consideration.	Numeric	Input
MNOG_MSR<j>_TORL<k>	The minimum outgoing usage made by a node for measure *j* to all the connected nodes having role *k*. For example, this variable computes the minimum number of outgoing SMS made by the node under consideration to all the nodes having role *k* that are connected to the node under consideration.	Numeric	Input
MNOGMR<j>_TNCHRL<k>	The minimum outgoing usage made by a node for measure *j* to all the connected non-churned nodes having role *k*. For example, this variable computes the minimum number of outgoing SMS made by the node under consideration to all the non-churned nodes having role *k* that are connected to the node under consideration.	Numeric	Input
MNOGMR<j>_TOCHRL<k>	The minimum outgoing usage made by a node for measure *j* to all the connected churned nodes having role *k*. For example, this variable computes the minimum number of outgoing SMS made by the node under consideration to all the churned nodes having role k that are connected to the node under consideration.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
MXDFICMR<j>_NDRL<k>	The maximum absolute difference between the incoming usage for measure *j* received by node under consideration and the incoming usage for measure *j* received by nodes having role *k* that are connected to the node under consideration. To compute this variable: Compute the total incoming usage for measure *j* received by the node under consideration. Compute the total incoming usage for measure *j* received by each of the nodes having role *k* that are connected to the node under consideration. Take the absolute difference between the incoming usage for measure *j* for the node under consideration and incoming usage for measure *j* for each node having role *k* that is connected to the node under consideration. Take the maximum of this absolute difference.	Numeric	Input
MXDOGCMR<j>_NDRL<k>	The maximum absolute difference between the outgoing usage for measure *j* made by node under consideration and the outgoing usage for measure *j* made by nodes having role *k* that are connected to the node under consideration. To compute this variable: Compute the total outgoing usage for measure *j* made by the node under consideration. Compute the total outgoing usage for measure *j* made by each of the nodes having role *k* that are connected to the node under consideration. Take the absolute difference between the outgoing usage for measure *j* for the node under consideration and outgoing usage for measure *j* for each node having role *k* that is connected to the node under consideration. Take the maximum of this absolute difference.	Numeric	Input
MXICMR<j>_FNCHRL<k>	The maximum incoming usage received by a node for measure *j* from all the connected non-churned nodes having role *k*. For example, this variable computes the maximum number of incoming SMS received by the node under consideration from all the non-churned nodes having role *k* that are connected to it.	Numeric	Input
MXICMR<j>_FRCHRL<k>	Maximum of incoming usage received by a node for measure *j* from all the connected churned nodes having role *k*. For example, this variable computes the maximum number of incoming SMS received by the node under consideration from all the churned nodes having role *k* that are connected to it.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
MXIN_MSR<j>_FMRL<k>	Maximum incoming usage received by a node for a measure *j* from all the connected nodes having role *k*. For example, this variable computes the maximum number of incoming SMS received by the node under consideration from all the nodes having role *k* that are connected to it.	Numeric	Input
MXOG_MSR<j>_TORL<k>	Maximum outgoing usage made by a node for measure a *j* to all the connected nodes having role *k*. For example, this variable computes the maximum number of outgoing SMS sent by the node under consideration to all the nodes having role *k* that are connected to it	Numeric	Input
MXOGMR27_TNCHRL<k>	Maximum of outgoing usage made by a node for measure *j* to all the connected non-churned nodes. For example, this variable computes the maximum number of outgoing SMS sent by the node under consideration to all the non-churned nodes that are connected to it.	Numeric	Input
MXOGMR<j>_TOCHRL<k>	Maximum of outgoing usage made by a node for measure j to all the connected churned nodes. For example, this variable computes the maximum number of outgoing SMS made by the node under consideration to all the churned nodes that are connected to it.	Numeric	Input
TO_OG_MR<j>_TO_CH_ND	Total outgoing usage made by a node for measure *j* to all the connected churned nodes. For example, this variable computes the total number of outgoing SMS made by the node under consideration to all the churned nodes that are connected to the node under consideration.	Numeric	Input
TO_OG_MR<j>_TONCH_ND	Total outgoing usage made by a node for measure *j* to all the connected non-churned nodes. For example, this variable computes the total number of outgoing SMS made by the node under consideration to all the non-churned nodes that are connected to the node under consideration.	Numeric	Input
TOCMLVL_AUTHORITY_VAL	Total Authority centrality measure at community level. This variable is computed as total of Authority centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
TOCMLVL_BETWEEN_VAL	Total Betweenness centrality measure at community level. This variable is computed as total of Betweenness centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_CLOSE_VAL	Total Closeness centrality measure at community level. This variable is computed as total of Closeness centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_CLOSEIN_VAL	Total In-closeness centrality measure at community level. This variable is computed as total of In-closeness centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_CLOSEOUT_VAL	Total Out-closeness centrality measure at community level. This variable is computed as total of Out-closeness centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_CLUSTCOEF_VAL	Total Clustering coefficient centrality measure at community level. This variable is computed as total of Clustering coefficient centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_DEGREE_VAL	Total Degree centrality measure at community level. This variable is computed as total of Degree centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_DEGREEIN_VAL	Total In-degree centrality measure at community level. This variable is computed as total of in-degree centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_DEGREEOUT_VAL	Total Out-degree centrality measure at community level. This variable is computed as total of out-degree centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_EIGEN_VAL	Total Eigenvector centrality measure at community level. This variable is computed as total of Eigenvector centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
TOCMLVL_HUB_VAL	Total Hub centrality measure at community level. This variable is computed as total of Hub centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_INC_MSR<j>	Total incoming usage for measure *j* at community level. This variable is computed as total of incoming usage for measure *j* of all the nodes that belong to the community to which the node under consideration belongs. For example, if the node under consideration belongs to community *i*, then this variable is computed as total of incoming SMS received by all the nodes that belong to community *i*.	Numeric	Input
TOCMLVL_INFLUENCE 1_VAL	Total Influence 1 centrality measure at community level. This variable is computed as total of centrality measure Influence 1 of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_INFLUENCE 2_VAL	Total Influence 2 centrality measure at community level. This variable is computed as the total of Influence 2 centrality measure of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOCMLVL_OUT_MSR<j >	Total outgoing usage for measure *j* at community level. This variable is computed as total of outgoing usage for measure *j* of all the nodes that belong to the community to which the node under consideration belongs.	Numeric	Input
TOIC_MR<j>_FM_NCH_ ND	Total incoming usage for measure *j* from all the connected non-churned nodes to the node under consideration. For example, this variable computes the total number of incoming SMS received by the node under consideration from all the non-churned nodes that are connected to the node under consideration.	Numeric	Input
TOIC_MR<j>_FMCHN_N D	Total incoming usage for measure *j* from all the connected churned nodes to the node under consideration. For example, this variable computes the total number of incoming SMS received by the node under consideration from all the churned nodes that are connected to the node under consideration.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
TOIC_MSR<j>_FMRL<k>	Total incoming usage for measure *j* from all the connected nodes having role k to the node under consideration. For example, this variable computes the total number of incoming SMS received by the node under consideration from all the nodes with role Leader that are connected to the node under consideration.	Numeric	Input
TOICMR<j>_FNCHRL<k>	Total incoming usage for measure *j* from all the connected non-churned nodes having role k to the node under consideration. For example, this variable computes the total number of incoming SMS received by the node under consideration from all the non-churned nodes with a leader role that are connected to the node under consideration.	Numeric	Input
TOICMR<j>_FRCHRL<k>	Total incoming usage for measure *j* from all the connected churned nodes having role *k* to the node under consideration. For example, this variable computes the total number of incoming SMS received by the node under consideration from all the churned nodes with a leader role and that are connected to the node under consideration.	Numeric	Input
TOOG_MSR<j>_TORL<k>	Total outgoing usage made by a node for a measure *j* to all the connected nodes that have a role *k*. For example, this variable computes the total number of outgoing SMS made by the node under consideration to all the nodes with a leader role that are connected to the node under consideration.	Numeric	Input
TOOGMR<j>_TNCHRL<k>	Total outgoing usage made by a node for measure *j* to all the connected non-churned nodes having role *k*. For example, this variable computes the total number of outgoing SMS sent by the node under consideration to all the non-churned nodes with leader role that are connected to the node under consideration.	Numeric	Input
TOOGMR<j>_TOCHRL<k>	Total outgoing usage of a node for measure *j* sent to all the connected churned nodes having role *k*. For example, this variable computes the total number of outgoing SMS sent by the node under consideration to all the churned nodes with a leader role that are connected to the node under consideration.	Numeric	Input
TOT_IC_ND_LVL_MSR<j>	Total incoming usage of a node for measure *j*. For example, this variable computes the total number of incoming SMS received by the node under consideration.	Numeric	Input

Column Name	Column Description	Data Type	Column Type
TOT_NO_OF_CONCT_RL <k>	Total number of nodes having role *k* that link to the node under consideration.	Numeric	Input
TOT_OG_ND_LVL_MSR <j>	Total outgoing usage of a node for measure *j*. For example, this variable computes the total number of outgoing SMS sent by the node under consideration.	Numeric	Input
TOTNO_CONCT_CHNRR L<k>	Total number of churned nodes having role *k* that link to the node under consideration.	Numeric	Input
TOTNO_CONCT_NOCHR L<k>	Total number of non-churned nodes having role *k* that link to the node under consideration.	Numeric	Input
CHURN_DT_FLG	Event Indicator for performance window. This variable indicates whether the event occurred in the timeframe of the performance window. For example, this variable is assigned a value 1 if the node churns in the period of the performance window and 0 otherwise. This variable is created for a modeling ABT.	Numeric	Target
CHURN_DT_FLG_1	Event Indicator for observation window. This variable indicates whether the event occurred in the timeframe of the observation window. For example, this variable is assigned a value 1 if the node churns in the period of the observation window and 0 otherwise. This variable is created for modeling and scoring ABTs.	Numeric	Input