



CDISC mapping to SDTM v1.0

APR-2018

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Disclaimer

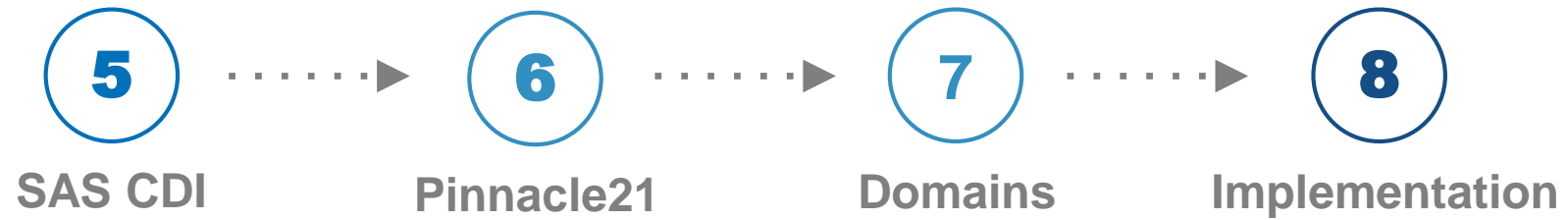
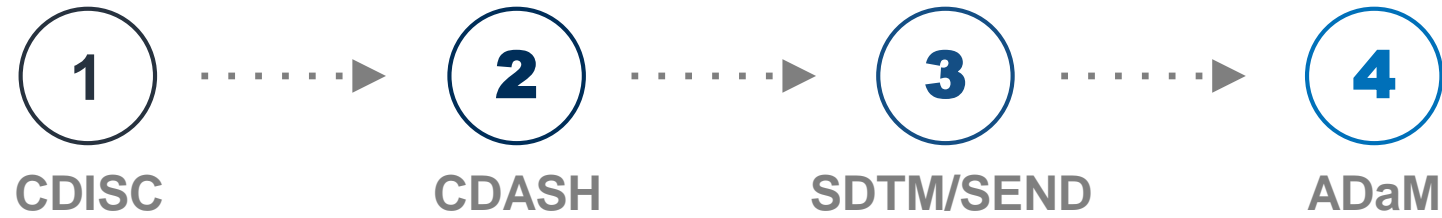
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Agenda



CDISC Standards

SDTM Study Data Tabulation Model

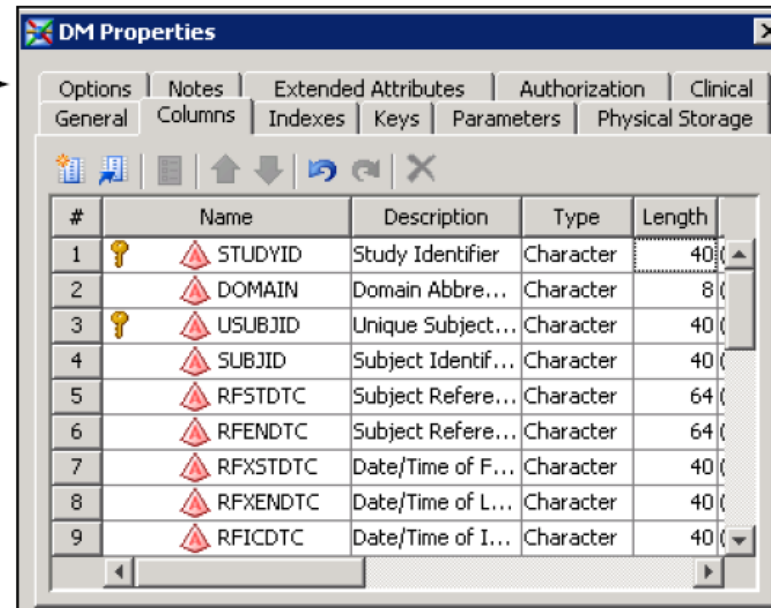
ADaM Analysis Data Model

SEND Standard for the Exchange of Non-Clinical Data

**DM domain metadata
definition supplied by SAS
Clinical Data Integration**

Domain metadata

- table-level attributes
- column level attributes



The screenshot shows the 'DM Properties' dialog box with the 'General' tab selected. It displays a table of domain metadata with columns for #, Name, Description, Type, and Length. The table lists nine domains, including STUDYID, DOMAIN, USUBJID, SUBJID, RFSTDTC, RFENDTC, RFXSTDTC, RFXENDTC, and RFICDTC. STUDYID and USUBJID are marked as primary keys with a key icon.

| # | Name | Description | Type | Length |
|---|----------|--------------------|-----------|--------|
| 1 | STUDYID | Study Identifier | Character | 40 |
| 2 | DOMAIN | Domain Abbre... | Character | 8 |
| 3 | USUBJID | Unique Subject... | Character | 40 |
| 4 | SUBJID | Subject Identif... | Character | 40 |
| 5 | RFSTDTC | Subject Refere... | Character | 64 |
| 6 | RFENDTC | Subject Refere... | Character | 64 |
| 7 | RFXSTDTC | Date/Time of F... | Character | 40 |
| 8 | RFXENDTC | Date/Time of L... | Character | 40 |
| 9 | RFICDTC | Date/Time of I... | Character | 40 |



- Global, open, multidisciplinary, non-profit organization.
- Mission: develop and support global, platform-independent data standards that enable information system interoperability to improve medical research and related areas of healthcare
- CDISC standards are vendor-neutral, platform-independent and freely available
- Standards to support clinical research data:
 - Acquisition
 - Exchange
 - Submission
 - Archive



CDASH

Clinical Data Acquisition Standards Harmonization

Acquisition

- **CDASH** establishes a standard way to **collect data in a similar way across studies and sponsors** so that data collection formats and structures provide clear traceability of submission data

<https://www.cdisc.org/standards/foundational/cdash>



Exchange

- **SDTM** provides a standard for organizing and formatting data to streamline processes in collection, management, analysis and reporting.
- One of the required standards for data submission to FDA (U.S.) and PMDA (Japan).

<https://www.cdisc.org/standards/foundational/sdtm>



SEND

Standard for Exchange of Nonclinical Data

Exchange

- **SEND** is an implementation of the SDTM standard for nonclinical studies. SEND specifies a way to collect and present nonclinical data in a consistent format.

<https://www.cdisc.org/standards/foundational/send>



ADaM

Analysis Data Model

Submission

- **ADaM** defines dataset and metadata standards that support:
 - efficient generation, replication, and review of clinical trial statistical analyses
 - traceability between analysis results, analysis data, and SDTM data

<https://www.cdisc.org/standards/foundational/adam>

ADaM will begins to be required from 15MAR2019



- SAS Clinical Data Integration (CDI)
 - helps organize, standardize and manage clinical research data
 - Provides repeatability and automation
 - facilitates the process of transforming data to meet industry-mandated data standards such as CDISC



- Pinnacle 21 Community:
 - Free software
 - Includes Validator, Define.xml Generator, Data Converter, and ClinicalTrials.gov Miner
 - Includes the last 5 releases of CDISC Terminology.

<https://www.pinnacle21.com/downloads>



Special-Purpose Domains

SDTM Domains

Special Purpose Domains is an SDTM category in its own right as they provide specific standardized structures to represent additional important information that does not fit any of the General Observation Classes.

- **CO (Comments):** collected on topical case report form (CRF) pages or on a separate page specifically dedicated to comments.
- **DM (Demographics):** standard variables that describe each subject in a clinical study
- **SE (Subject Elements):** actual order of elements followed by the subject
- **SV (Subject Visits):** actual start and end data/time for each visit of each individual subject



General Observation Classes

SDTM Domains

Most subject-level observations collected during the study should be represented according to one of the three SDTM general observation classes.

- **Interventions:**

- **CM (Concomitant and Prior Medications):** Concomitant and Prior Medications/Therapies used by the subject
- **EX (Exposure):** details of a subject's exposure to protocol-specified study treatment
- **EC (Exposure as Collected):** protocol-specified study treatment administrations, as collected
- **PR (Procedures):** collected details describing a subject's therapeutic and diagnostic procedures
- **SU (Substance Use):** substance use information that may be used to assess the efficacy and/or safety of therapies that look to mitigate the effects of chronic substance use.



General Observation Classes

SDTM Domains

- **Events:**
 - **AE (Adverse Events):** Adverse events recorded in CRF either as free text or a pre-specified list of terms
 - **CE (Clinical Events):** clinical events of interest that would not be classified as adverse events.
 - **DS (Disposition):** information representing data, vocabulary or records related to disposition.
 - **DV (Protocol Deviations):** protocol violations and deviations during the course of the study (not a response to each violation or deviation)
 - **HO (Healthcare Encounters):** inpatient and outpatient healthcare events (e.g., hospitalizations, ambulatory surgery, ...).
 - **MH (Medical History):** subject's prior history at the start of the trial.



General Observation Classes

SDTM Domains

- Findings:
 - DA (Drug Accountability)
 - DD (Death Details)
 - EG (Electrocardiogram Results)
 - IE (Inclusion/Exclusion Criteria Not Met)
 - IS (Immunogenicity Specimen Assessments)
 - LB (Laboratory Test Findings)
 - MB (Microbiology specimen findings)
 - MS (microbiology susceptibility test results)
 - MI (Microscopic Findings)
 - MO (Morphology)
 - PC (Concentrations of drugs/metabolites in fluids or tissues)
 - PP (Pharmacokinetic parameters derived from PC data)
 - PE (Physical Exam)
 - QS (Questionnaires)
 - RP (Reproductive System Findings)
 - SC (Subject Characteristics)
 - SS (Subject Status)
 - TU (Tumor Identification)
 - TR (Tumor Response)
 - SR (Disease Response)
 - VS (Vital Signs)
 - FA (Findings About)



Trial Design Datasets

SDTM Domains

- Experimental Design:
 - TA (Trial Arms): describes each planned arm in the trial
 - TE (Trial Elements): definitions of the elements that appear in the Trial A
- Scheduling of Assessments:
 - TV (Trial Visits): describes the planned Visits in a trial
 - TD (Trial Disease Assessments): information on the protocol-specified disease assessment schedule
- Trial Summary and Eligibility:
 - TI (Trial Inclusion/Exclusion Criteria): It contains all the inclusion and exclusion criteria for the trial (not subject oriented)
 - TS (Trial Summary): summary of the trial in a structured format

Implementation



Extract from OC

Data can come from several sources; Oracle, Medidata, SQL but also from excel or SAS Datasets



Transform in SAS CDI

SAS CDI allows transform the original data from the different sources to standard format, either SDTM, ADaM, SEND,.. through a set of predefined process.



Load SDTM Domains

Once we have our data standardized are load in the templates of standardized domains.



Validate SDTM Domains

The information in the built domains must be validated to ensure that meet the standardization criteria.



Implementation

- Requirements
 - Define a study
 - Define a library
 - Original datasets
 - Load the standard
- Steps
 - Registry the original datasets
 - Create a new Job
 - Identify the variables and datasets to include in the domain
 - Do the necessary transformation to conform the final domain to upload into the standard
 - Domain validation




Implementation

- For carry out the mapping we use the SDTM Implementation guideline V3.2 (V3.3 will be release at 18th May 2018)
- In the implementation guideline we can find all information about the domain like:
 - The description: The Demographics domain includes a set of essential standard variables that describe each subject in a clinical study. It is the parent domain for all other observations for human clinical subjects.
 - Structure definition:

DM – Specification for the Demographics Domain Model

dm.xpt, Demographics — Version 3.2. One record per subject, Tabulation

| Variable Name | Variable Label | Type | Controlled Terms, Code list or Format | Role | CDISC Notes | Core |
|---------------|------------------------------------|------|---------------------------------------|------------------|--|------|
| STUDYID | Study Identifier | Char | | Identifier | Unique identifier for a study. | Req |
| DOMAIN | Domain Abbreviation | Char | DM | Identifier | Two-character abbreviation for the domain. | Req |
| USUBJID | Unique Subject Identifier | Char | | Identifier | Identifier used to uniquely identify a subject across all studies for all applications or submissions involving the product. This must be a unique number, and could be a compound identifier formed by concatenating STUDYID-SITEID-SUBJID. | Req |
| SUBJID | Subject Identifier for the Study | Char | | Topic | Subject identifier, which must be unique within the study. Often the ID of the subject as recorded on a CRF. | Req |
| RFSTDTC | Subject Reference Start Date/Time | Char | ISO 8601 | Record Qualifier | Reference Start Date/time for the subject in ISO 8601 character format. Usually equivalent to date/time when subject was first exposed to study treatment. Required for all randomized subjects; will be null for all subjects who did not meet the milestone the date requires, such as screen failures or unassigned subjects. | Exp |
| RFENDTC | Subject Reference End Date/Time | Char | ISO 8601 | Record Qualifier | Reference End Date/time for the subject in ISO 8601 character format. Usually equivalent to the date/time when subject was determined to have ended the trial, and often equivalent to date/time of last exposure to study treatment. Required for all randomized subjects; null for screen failures or unassigned subjects. | Exp |
| RFXSTDTC | Date/Time of First Study Treatment | Char | ISO 8601 | Record Qualifier | First date of exposure to any protocol-specified treatment or therapy, equal to the earliest value of EXSTDTC. | Exp |
| RFXENDTC | Date/Time of Last Study Treatment | Char | ISO 8601 | Record Qualifier | Last date of exposure to any protocol-specified treatment or therapy, equal to the latest value of EXENDTC (or the latest value of EXSTDTC if EXENDTC was not collected or is missing). | Exp |



Implementation

CDISC Core Variables

- A **Required** variable is any variable that is basic to the identification of a data record (i.e., essential key variables and a topic variable) or is necessary to make the record meaningful. Required variables must always be included in the dataset and cannot be null for any record.
- An **Expected** variable is any variable necessary to make a record useful in the context of a specific domain. Expected variables may contain some null values, but in most cases will not contain null values for every record. When no data has been collected for an expected variable, however, a null column must still be included in the dataset, and a comment must be included in the define.xml to state that data was not collected.
- A **Permissible** variable should be used in a domain as appropriate when collected or derived. Except where restricted by specific domain assumptions, any SDTM Timing and Identifier variables, and any Qualifier variables from the same general observation class are permissible for use in a domain based on that general observation class. The Sponsor can decide whether a Permissible variable should be included as a column when all values for that variable are null. The sponsor does not have the discretion to exclude permissible variables when they contain data.



Implementation

- Assumptions:

DM – Assumptions for the Demographics Domain Model

1. Investigator and site identification: Companies use different methods to distinguish sites and investigators. CDISC assumes that SITEID will always be present, with INVID and INVNAM used as necessary. This should be done consistently and the meaning of the variable made clear in the define.xml.
2. Every subject in a study must have a subject identifier (SUBJID). In some cases a subject may participate in more than one study. To identify a subject uniquely across all studies for all applications or submissions involving the product, a unique identifier (USUBJID) must be included in all datasets. Subjects occasionally change sites during the course of a clinical trial. The sponsor must decide how to populate variables such as USUBJID, SUBJID and SITEID based on their operational and analysis needs, but only one DM record should be submitted for the subject. The Supplemental Qualifiers dataset may be used if appropriate to provide additional information.
3. Concerns for subject privacy suggest caution regarding the collection of variables like BRTHDTC. This variable is included in the Demographics model in the event that a sponsor intends to submit it; however, sponsors should follow regulatory guidelines and guidance as appropriate.
4. The values of ARM and ARMCD in DM must match entries in the Trial Arms (TA) dataset, except for subjects who were not fully assigned to an Arm. Subjects who did not receive the treatments to which they were assigned will still have the values of ARM and ARMCD to which they were assigned. SE/DM Examples 1 and 2 in *Section 5 - SE Domain: SE - Examples for the SUBJECT ELEMENTS Domain Model* show examples of subjects whose actual treatment did not match their planned treatment.

Some subjects may leave the trial before they can be assigned to an Arm, or, in the case of trials where Arm is assigned by two or more successive allocation processes, may leave before the last of these processes. Such subjects will not be assigned to one of the planned Arms described in the Trial Arms dataset, and must have special values of ARM and ARMCD assigned.

- Data for screen failure subjects, if submitted, should be included in the Demographics dataset, with ARMCD = "SCRNFAIL" and ARM = "Screen Failure". Sponsors may include a record in the Disposition dataset indicating when the screen failure event occurred. DM/SE Example 6 shows an example of data submitted for a screen failure subject.
 - Some trial designs include Elements after screening but before Arm assignments are made, and so may have subjects who are not screen failures, but are not assigned to an Arm. Subjects withdrawn from a trial before assignment to an Arm, if they are not screen failures, should have ARMCD = "NOTASSGN" and ARM = "Not Assigned". Example Trial 1 in *Section 7.2 - Experimental Design: Example Trial 1, A Parallel Trial, TA - Examples For Trial Arms Dataset*, which includes a screening Epoch and a run-in Epoch before randomization, is an example of such a trial; data for a subject who passed screening but was not randomized in this trial are shown in DM/SE Example 6.
 - In trials where Arm assignment is done by means of two or more allocation processes at separate points in time, subjects who drop out after the first allocation process but before the last allocation process, should be assigned values of ARMCD that reflect only the allocation processes they underwent. Example Trial 3, *Section 7.2 - Experimental Design: Example Trial 3, A Trial With Multiple Branch Points, TA - Examples for Trial Arms Dataset*, is such a trial. DM/SE Example 7 shows sample data for subjects in this trial.
5. When study population flags are included in SDTM, they are treated as Supplemental Qualifiers [see *Section 8: 8.4, Relating Non-Standard Variables Values To A Parent Domain*] to DM and placed in the SUPPDM dataset. Controlled terms for these subject-level population flags, (e.g., COMPLT, SAFETY, ITT and PPROT) are listed in *Appendix C2 - Supplemental Qualifier Name Codes*. See ICH E9 for more information and definitions. Note that the ADaM subject-level analysis dataset (ADSL) includes population flags; consult the ADaM Implementation Guide for more information about these variables.



Implementation

- Different examples:

DM – Examples for the Demographics Domain Model

Examples of using the DM domain for typical scenarios are provided below. Example 1 displays the all Required and Expected variables; in examples 2 - 6, certain Required or Expected variables have been omitted in consideration of space and clarity. Example 1 is a general Demographics example showing typical data recorded for a clinical trial. Examples 2 through 5 display various scenarios for representing race and ethnicity information. Example 6 shows the handling of ARMCD for Subjects Withdrawn before Assignment to an Arm, and Example 7 shows the handling ARMCD for Subjects Withdrawn when assignment to an Arm is Incomplete.

DM Example 1 – General Demographics

dm.xpt

| Row | STUDYID | DOMAIN | USUBJID | SUBJID | RFSTDTC | RFENDTC | RFXSTDTC | RFXENDTC | RFICTTC | RFPENDTC |
|-----|---------|--------|-------------|--------|------------|------------|------------|------------|------------|------------|
| 1 | ABC123 | DM | ABC12301001 | 001 | 2006-01-12 | 2006-03-10 | 2006-01-12 | 2006-03-10 | 2006-01-03 | 2006-04-01 |
| 2 | ABC123 | DM | ABC12301002 | 002 | 2006-01-15 | 2006-02-28 | 2006-01-15 | 2006-02-28 | 2006-01-04 | 2006-03-26 |
| 3 | ABC123 | DM | ABC12301003 | 003 | 2006-01-16 | 2006-03-19 | 2006-01-16 | 2006-03-19 | 2006-01-02 | 2006-03-19 |
| 4 | ABC123 | DM | ABC12301004 | 004 | | | | | 2006-01-07 | 2006-01-08 |
| 5 | ABC123 | DM | ABC12302001 | 001 | 2006-02-02 | 2006-03-31 | 2006-02-02 | 2006-03-31 | 2006-01-15 | 2006-04-12 |
| 6 | ABC123 | DM | ABC12302002 | 002 | 2006-02-03 | 2006-04-05 | 2006-02-03 | 2006-04-05 | 2006-01-10 | 2006-04-25 |

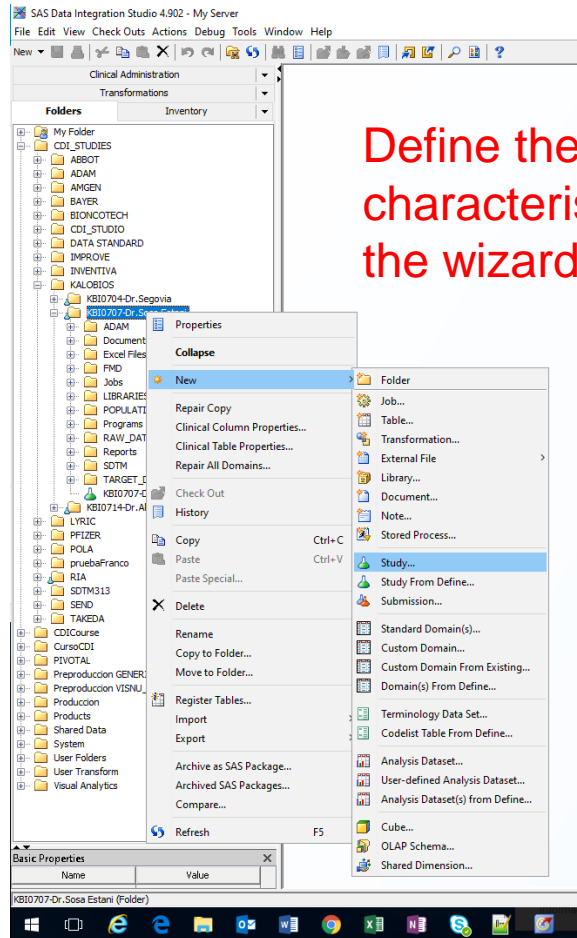
| Row | SITEID | INVTNAM | BRTHDTC | AGE | AGEU | SEX | RACE | ETHNIC |
|----------|--------|-------------|------------|-----|-------|-----|--|------------------------|
| 1 (cont) | 01 | JOHNSON, M | 1948-12-13 | 57 | YEARS | M | WHITE | HISPANIC OR LATINO |
| 2 (cont) | 01 | JOHNSON, M | 1955-03-22 | 50 | YEARS | M | WHITE | NOT HISPANIC OR LATINO |
| 3 (cont) | 01 | JOHNSON, M | 1938-01-19 | 68 | YEARS | F | BLACK OR AFRICAN AMERICAN | NOT HISPANIC OR LATINO |
| 4 (cont) | 01 | JOHNSON, M | 1941-07-02 | | | M | ASIAN | NOT HISPANIC OR LATINO |
| 5 (cont) | 02 | GONZALEZ, E | 1950-06-23 | 55 | YEARS | F | AMERICAN INDIAN OR ALASKA NATIVE | NOT HISPANIC OR LATINO |
| 6 (cont) | 02 | GONZALEZ, E | 1956-05-05 | 49 | YEARS | F | NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDERS | NOT HISPANIC OR LATINO |

| Row | ARMCD | ARM | ACTARMCD | ACTARM | COUNTRY |
|----------|----------|----------------|----------|----------------|---------|
| 1 (cont) | A | Drug A | A | Drug A | USA |
| 2 (cont) | P | Placebo | P | Placebo | USA |
| 3 (cont) | P | Placebo | P | Placebo | USA |
| 4 (cont) | SCRNFAIL | Screen Failure | SCRNFAIL | Screen Failure | USA |
| 5 (cont) | P | Placebo | P | Placebo | USA |
| 6 (cont) | A | Drug A | A | Drug A | USA |



Implementation

Working with SAS Data Integration Studio: Creating a new Study



Define the study characteristics following the wizard

New Study

General Information
Specify general information

Name:
Test

Description:

Folder template:
MITEMPLATE

Location:
/CDI_STUDIES/KALOBOS/KB10707-Dr.Sosa Estani

< Back Next > Finish Cancel Help

Choose the standard to be used in the study

New Study

Data Standards Selection
Select the Data Standards to apply

Select the Data Standards:

| Name | Base Standard | Base Standard Version |
|----------------------|---------------|-----------------------|
| CDISC ADAM V2.1 | ADAM | 2.1 |
| data_standard_franco | SEND | 3.0 |
| SDTM313 | SDTM | 3.1.3 |
| SDTMv3.2 | SDTM | 3.2 |

< Back Next > Finish Cancel Help

New Study

Library Selection
Select the libraries to create

Available Librefs:

| Name | Libref | Description |
|-------------------|---------|------------------------------|
| ADAM Domains | ADAM | ADAM LIBRARY |
| Reports | reports | |
| SDTM Domains | SDTM | SDTM |
| Source Data | SCRDATA | SOURCE DATA |
| Study Terminology | studyCT | Study Controlled Terminology |

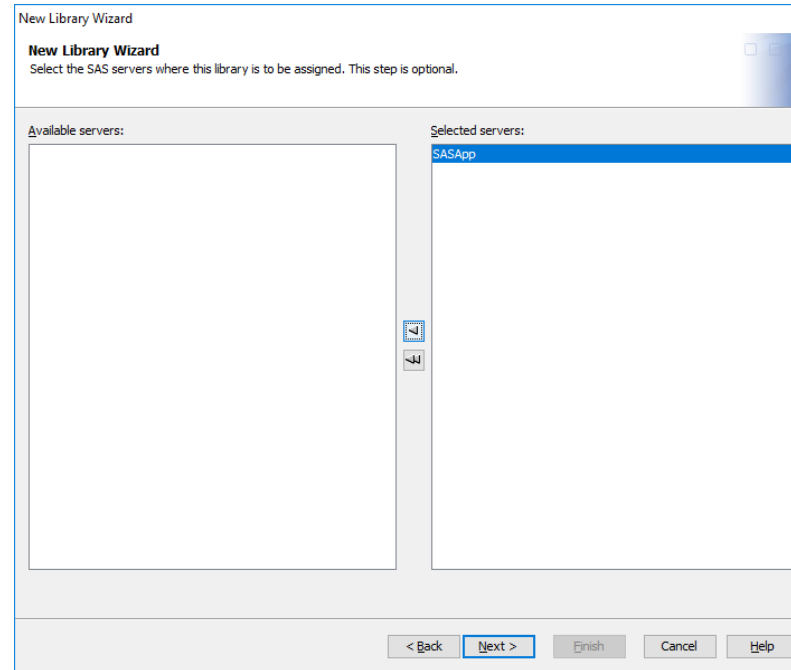
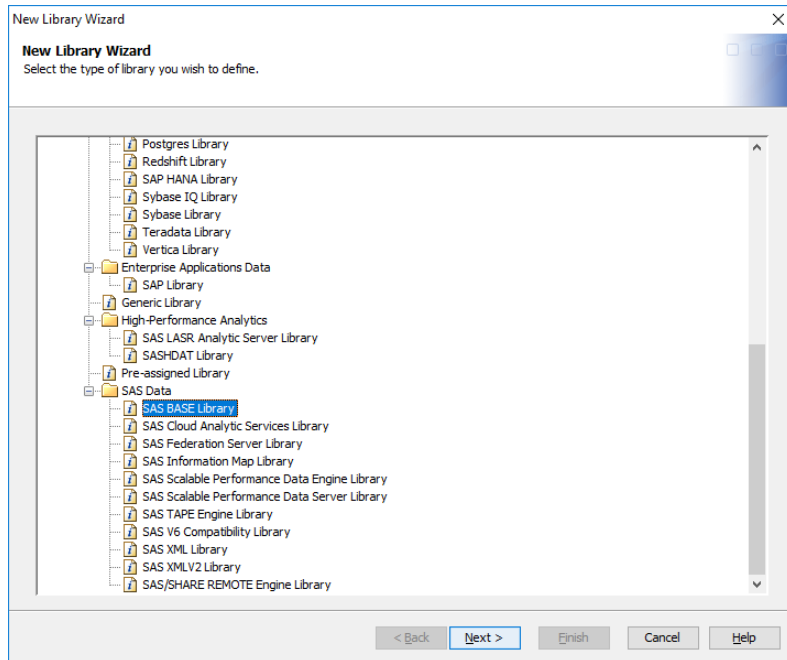
< Back Next > Finish Cancel Help



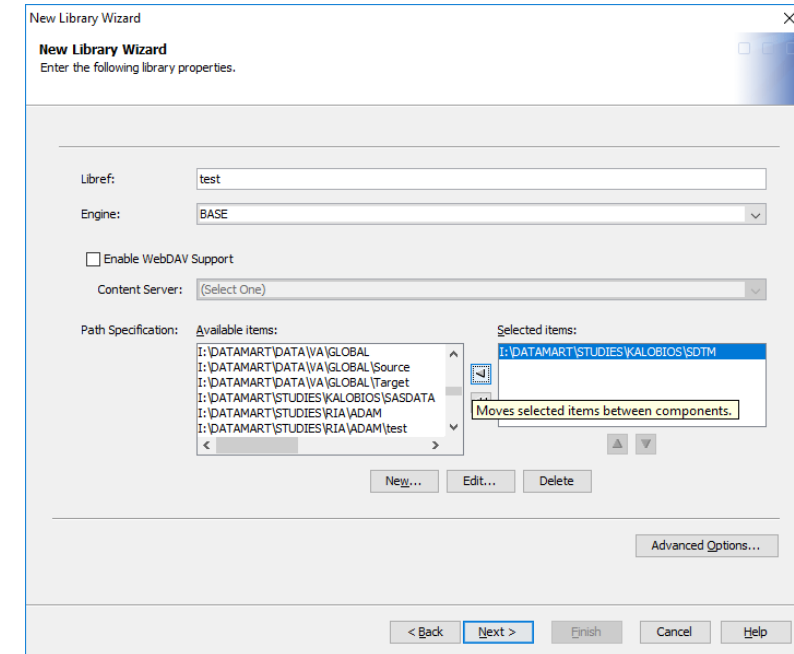
Implementation

Working with SAS Data Integration Studio: Creating a new Study

Create a SAS BASE library



Choose a library reference and root for physical files

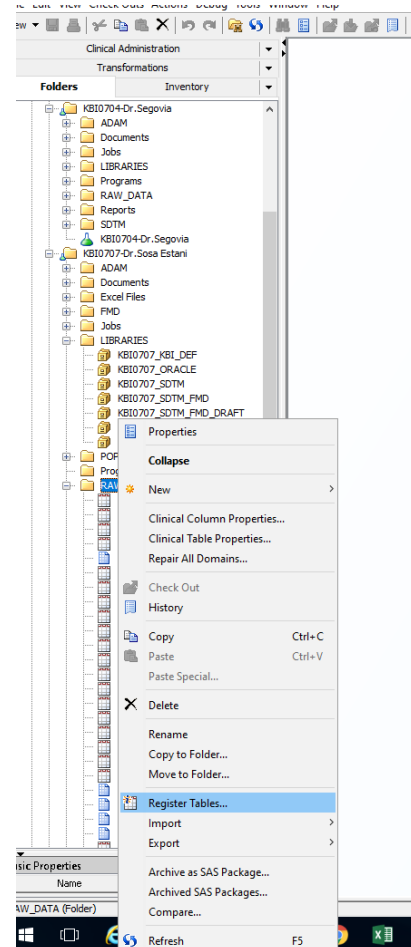




Implementation

Working with SAS Data Integration Studio: Registry of tables

Registry SAS datasets tables

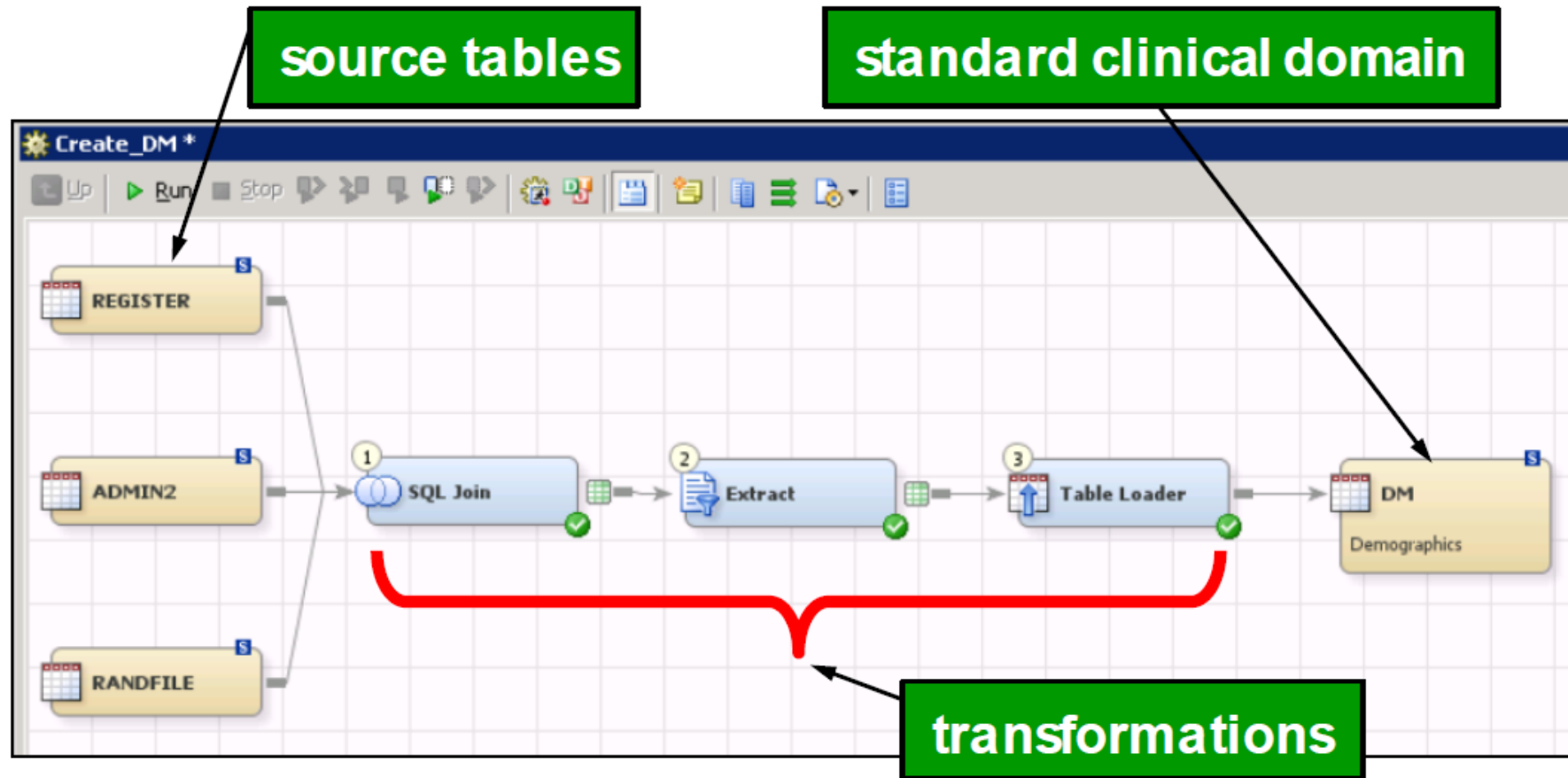


Now the datasets are created in the metadata server



Implementation

- Visually design jobs to transform clinical data into standard domains





Implementation

- Import CDISC-controlled terminology tables

The screenshot displays a software interface with a 'Clinical Administration' folder structure on the left and a 'View Data: TERMS (8,145 rows)' table on the right.

Clinical Administration Folder Structure:

- Folders
- Inventory
- Clinical Administration
 - Defaults
 - Studies
 - PainXD
 - PainXD2
 - Submissions
 - Data Standards
 - ADAM V2.1
 - SDTM V3.1
 - SDTM V3.2
 - Terminology Pa...

View Data: TERMS (8,145 rows) Table:

| # | sourcesystem | sourcesystemversion | description | codelist | codelist_code | codelist_name | codeli |
|----|---------------|---------------------|------------------|----------|---------------|------------------------|--------|
| 1 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 2 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 3 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 4 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 5 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 6 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 7 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACN | C66767 | Action Taken with S... | No |
| 8 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACSPCAT | C101865 | Acute Coronary Sy... | No |
| 9 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACSPCAT | C101865 | Acute Coronary Sy... | No |
| 10 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACSPCAT | C101865 | Acute Coronary Sy... | No |
| 11 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACSPCAT | C101865 | Acute Coronary Sy... | No |
| 12 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | ACSPCAT | C101865 | Acute Coronary Sy... | No |
| 13 | NCI Thesaurus | 2014-06-27 | CDISC SDTM Co... | AESEV | C66769 | Severity/Intensity ... | No |



Implementation

- Import and manage compliance checks

| Manage Compliance Checks: SDTM V3.2 | |
|-------------------------------------|--|
| Available checks: | |
| Check ID | Description |
| SDTM0004 | Source metadata includes domain data set not found in reference metadata |
| SDTM0005 | Custom domain data set does not adhere to specification naming guidelines |
| SDTM0006 | Source data library contains domain data not found in study metadata |
| SDTM0011 | Identifies a column that was described in the domain description but not included in the SAS dataset for that domain |
| SDTM0014 | Identifies a column listed in the domain description as Permissible ('Perm') but not included in the SAS dataset for that domain |
| SDTM0018 | Identifies a domain that appears to be Associated Persons data but does not contain the Associated Persons Identifier (APID) |
| SDTM0022 | Column length < length defined in standard |
| SDTM0023 | Column length > length defined in standard |
| SDTM0031 | Column format found but column not subject to controlled terminology |
| SDTM0032 | Column format found but format name mismatch with standard controlled terminology name |
| SDTM0202 | Identifies a null (empty) value found in a column where (Standard) Core attribute is 'Exp' |
| SDTM0203 | Character column value is not correctly upcased per spec |
| SDTM0204 | Character column value contains the numeric missing '.' or any special missing value like '.N' |
| SDTM0205 | Column value is not left-justified |
| SDTM0271 | Value for column defined as a data set key is null |

SAS CDI Functionality

- Execute compliance checks for domains column structure and data values

SAS Clinical Standards Toolkit 1.7
CDISC-SDTM 3.2 VALIDATION

Process Results, CheckID: SDTM0204

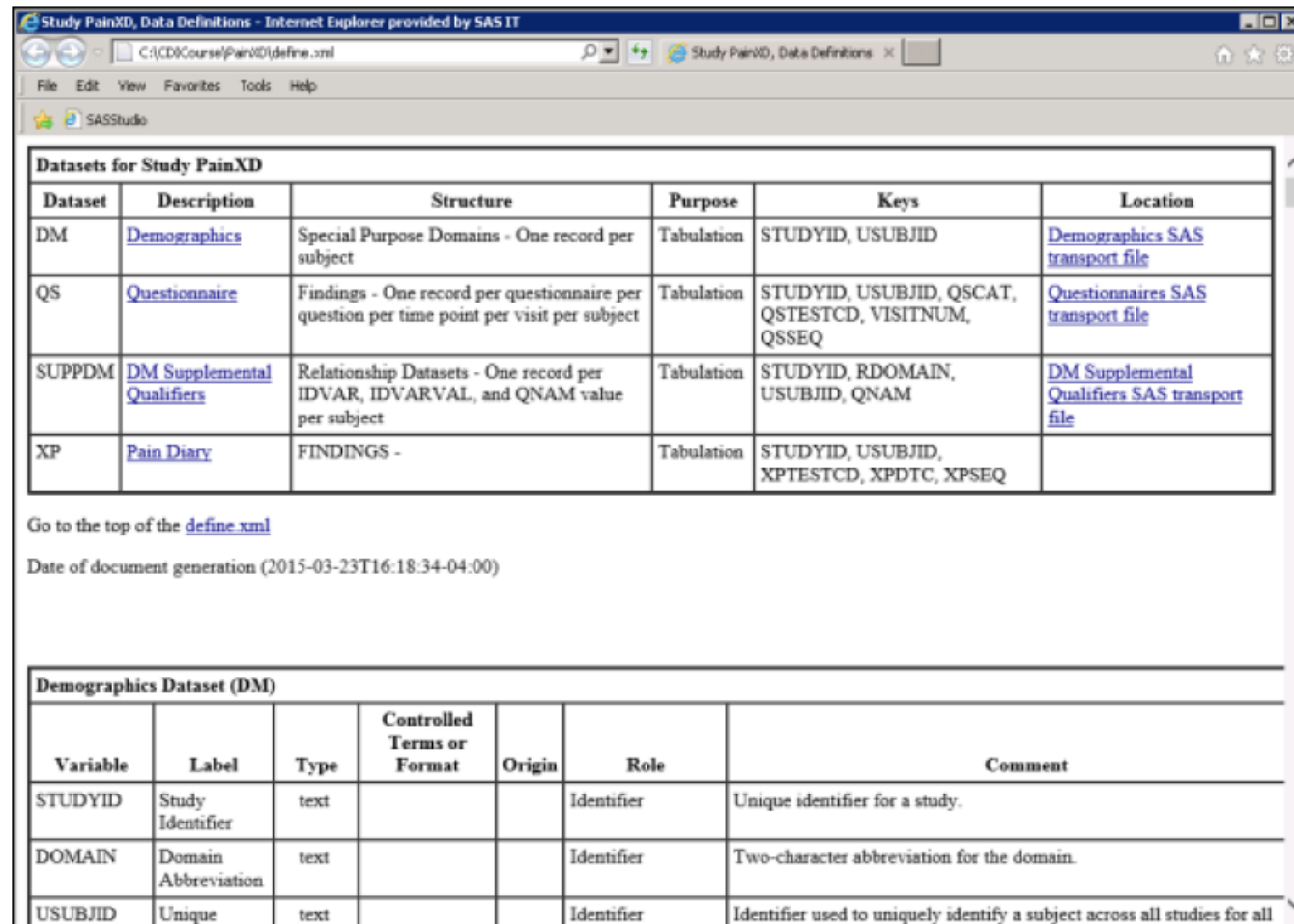
Description: Character column value contains the numeric missing '.' or any special missing value like '.N'
Check scope: (Tables) _ALL_, (Columns) _ALL_
Source: SAS (SAS0011)
Validation check macro: cstcheck_column, using source metadata

| Check Invocation | Seq # | Source Data | Result Identifier | Message | Severity | Problem Detected? | Actual Value | Keys |
|------------------|-------|-------------|-------------------|---|----------|-------------------|--------------|--|
| 1 | 3 | sdm.QS | SDTM0204 | Column value contains numeric missing value | Note | Yes | QSORRES=. | STUDYID=PXD,USUBJID=PXD-130-4006,QSCAT=BRIEF PAIN INVENTORY: MODIFIED SHORT FORM,QSTESTCD=BP1Q03,VISITNUM=3,QSSEQ=25 |
| 1 | 3 | sdm.QS | SDTM0204 | Column value contains numeric missing value | Note | Yes | QSORRES=. | STUDYID=PXD,USUBJID=PXD-130-4006,QSCAT=BRIEF PAIN INVENTORY: MODIFIED SHORT FORM,QSTESTCD=BP1Q03,VISITNUM=3,QSSEQ=25 |
| 1 | 3 | sdm.QS | SDTM0204 | Column value contains numeric missing value | Note | Yes | QSORRES=. | STUDYID=PXD,USUBJID=PXD-130-4006,QSCAT=BRIEF PAIN INVENTORY: MODIFIED SHORT |



SAS CDI Functionality

- Generate CDISC standard define.xml describing domain and study metadata for clinical submissions



| Dataset | Description | Structure | Purpose | Keys | Location |
|---------|--|---|------------|--|---|
| DM | Demographics | Special Purpose Domains - One record per subject | Tabulation | STUDYID, USUBJID | Demographics SAS transport file |
| QS | Questionnaire | Findings - One record per questionnaire per question per time point per visit per subject | Tabulation | STUDYID, USUBJID, QSCAT, QSTESTCD, VISITNUM, QSSEQ | Questionnaires SAS transport file |
| SUPPDM | DM Supplemental Qualifiers | Relationship Datasets - One record per IDVAR, IDVARVAL, and QNAM value per subject | Tabulation | STUDYID, RDOMAIN, USUBJID, QNAM | DM Supplemental Qualifiers SAS transport file |
| XP | Pain Diary | FINDINGS - | Tabulation | STUDYID, USUBJID, XPTESTCD, XPDTCD, XPSEQ | |

Go to the top of the [define.xml](#)

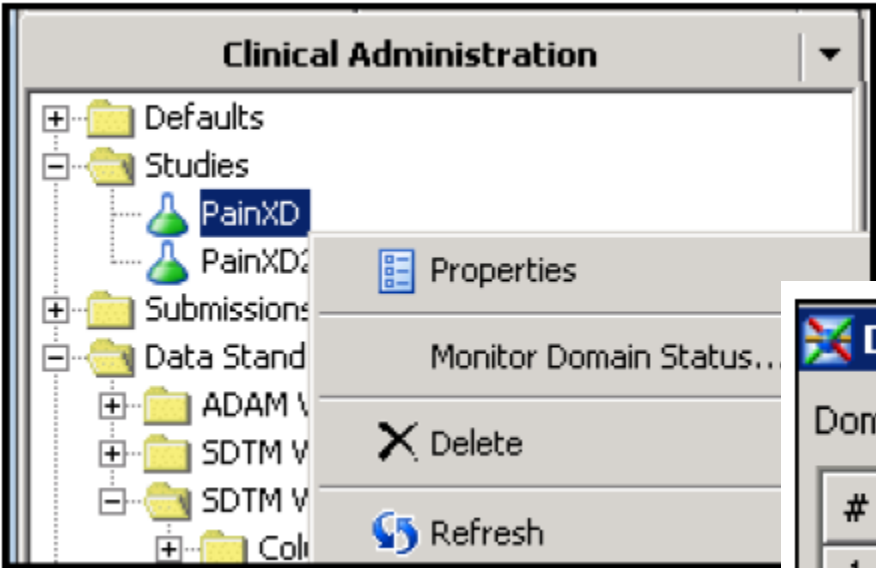
Date of document generation (2015-03-23T16:18:34-04:00)

| Variable | Label | Type | Controlled Terms or Format | Origin | Role | Comment |
|----------|---------------------|------|----------------------------|--------|------------|---|
| STUDYID | Study Identifier | text | | | Identifier | Unique identifier for a study. |
| DOMAIN | Domain Abbreviation | text | | | Identifier | Two-character abbreviation for the domain. |
| USUBJID | Unique | text | | | Identifier | Identifier used to uniquely identify a subject across all studies for all |



SAS CDI Functionality

- Monitor the progress of clinical data integration projects

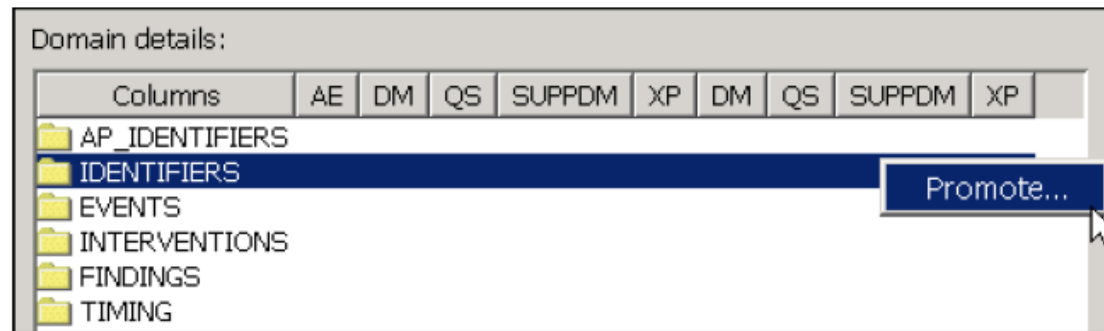
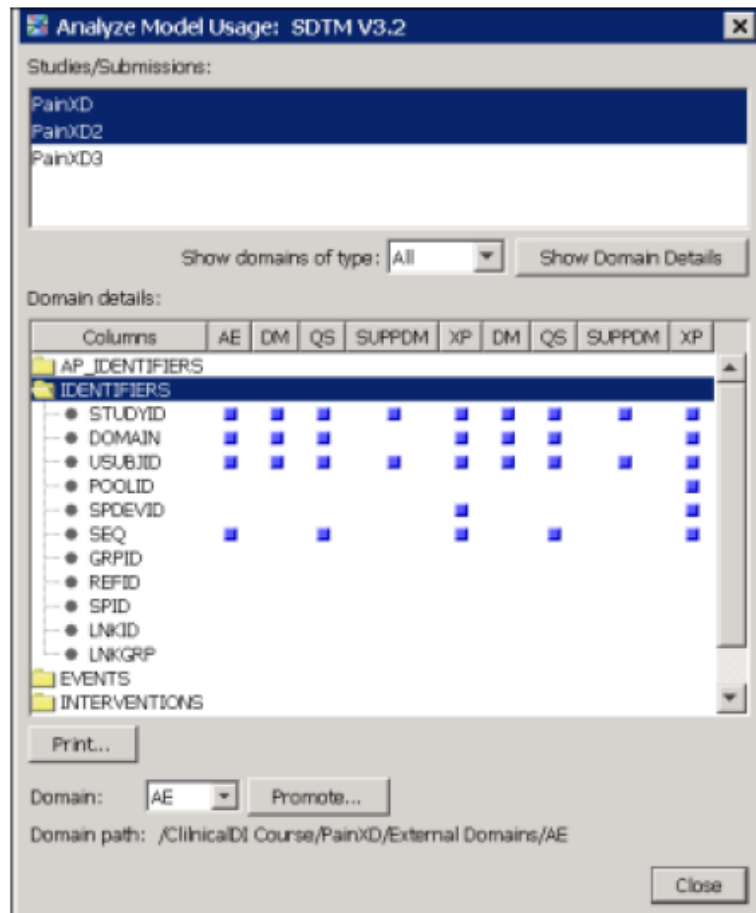


| Domain Status: PainXD | | | | | | |
|-----------------------|--------|---------|----------------------------|------------|---------------|-----------|
| Domains: | | | | | | |
| # | Name | ID | Description | Is Mapp... | Is Validated? | Locked By |
| 1 | QS | QS | Questionnaire | Yes | Yes | |
| 2 | XP | XP | Pain Diary | Yes | No | |
| 3 | DM | DM | Demographics | Yes | Yes | |
| 4 | AE | AE | Adverse Events | No | Yes | |
| 5 | SUPPDM | SUPP... | DM Supplemental Qualifiers | Yes | No | |



SAS CDI Functionality

- Compare domain usage across clinical studies and promote custom domains for general use



SAS CDI Functionality

- Integration with Electronic Data Capture (EDC) systems
 - Data capture from RAVE
 - Data capture from Oracle



SAS Data Integration Studio Interface

- SAS Data Integration Studio has many components available in the desktop interface

The screenshot displays the SAS Data Integration Studio 4.9 interface. On the left, the 'Folders' pane shows a project structure with 'ClinicalDI Course' containing 'PainXD', 'PainXD2', and 'SubjectInfo1'. 'SubjectInfo1' includes 'ExcelTreatment', 'Load SubjectsInfo', 'Source', 'SubjectInfo', 'SUBJECTS', 'Target Library', 'TreatmentGroups', and 'TransposeSubjectInfo_predefined'. The 'Transformations' pane lists various data processing tasks like 'Data Quality', 'Hadoop', 'High-Performance Analytics', 'Output', 'Publish', 'SPD Server Dynamic Cluster', and 'SQL'.

The main workspace shows a data flow diagram titled 'Load SubjectsInfo'. It features two input nodes, 'SUBJECTS' and 'TreatmentGroups', which feed into a 'Join' node. The output of the 'Join' node is a 'SubjectInfo' node. The diagram is executed successfully, as indicated by the green checkmarks on the nodes.

Below the diagram, the 'Details' pane shows a table with the execution log:

| Order | Name | Status | Details |
|-------|-------------------|------------------------|---------|
| 1 | Precode | Completed successfully | |
| 2 | Join | Completed successfully | |
| 3 | Postcode | Completed successfully | |
| | Load SubjectsInfo | Completed successfully | |

The status bar at the bottom indicates the user is 'cdiuser@SASBAP as CDI User' and the session ID is 'sasbap : 8561'.

SAS Data Integration Studio Interface

The screenshot displays the SAS Data Integration Studio 4.9 interface. The title bar at the top reads "SAS Data Integration Studio 4.9 - CDI User". Below it is a menu bar with options: File, Edit, View, Check Outs, Actions, Debug, Tools, Window, Help. A toolbar with various icons is located below the menu bar. On the left side, there is a "Folders" pane showing a tree structure of folders and files, including "My Folder", "ClinicalDI Course", "PainXD", "PainXD2", "SubjectInfo1", "ExcelTreatment", "Load SubjectsInfo", "Source", "SubjectInfo", "SUBJECTS", "Target Library", "TreatmentGroups", "TransposeSubjectInfo_predefined", "Products", "Shared Data", "System", and "User Folders". Below the "Folders" pane is a "Transformations" pane with a list of data integration tasks: Data Quality, Hadoop, High-Performance Analytics, Output, Publish, SPD Server Dynamic Cluster, and SQL. The SQL section is expanded, showing tasks like Create Table, Delete, Execute, Extract, Insert Rows, Join, Merge, Set Operators, and Update. The main workspace in the center shows a data flow diagram titled "Load SubjectsInfo". It features two input nodes, "SUBJECTS" and "TreatmentGroups", which are joined by a "Join" node (labeled with a circled 1). The output of the join is a "SubjectInfo" node. Below the diagram is a "Details" pane with tabs for Status, Warnings and Errors, Statistics, and Control Flow. The "Status" tab is active, showing a table of execution results. The table has columns for Order, Name, Status, and Details. The execution log shows four steps: 1 Precode, 2 Join, 3 Postcode, and Load SubjectsInfo, all of which completed successfully. At the bottom of the interface, a status bar indicates the session is "Completed successfully".

Title Bar

Menu Bar

Toolbar

Status Bar

| Order | Name | Status | Details |
|-------|-------------------|------------------------|---------|
| 1 | Precode | Completed successfully | |
| 2 | Join | Completed successfully | |
| 3 | Postcode | Completed successfully | |
| | Load SubjectsInfo | Completed successfully | |

Tree View, basic properties pane

The screenshot displays the SAS Data Integration Studio 4.9 interface. On the left, the 'Folders' pane shows a tree view of the project structure, including 'My Folder', 'ClinicalDI Course', 'PainXD', 'PainXD2', 'SubjectInfo1', 'ExcelTreatment', 'Load SubjectsInfo', 'Source', 'SubjectInfo', 'SUBJECTS', 'Target Library', 'TreatmentGroups', 'TransposeSubjectInfo_predefined', 'Products', 'Shared Data', 'System', and 'User Folders'. A red box highlights this pane, and a green box labeled 'Tree View' points to it. Below the 'Folders' pane is the 'Transformations' pane, which lists various data integration tasks such as 'Data Quality', 'Hadoop', 'High-Performance Analytics', 'Output', 'Publish', 'SPD Server Dynamic Cluster', and 'SQL'. The main workspace shows a data flow diagram with nodes for 'SUBJECTS', 'TreatmentGroups', 'Join', and 'SubjectInfo'. The 'Details' pane at the bottom right shows the execution status of the tasks, indicating they were completed successfully. The status bar at the bottom shows 'SASApp' and 'cdiuser@SASBAP as CDI User'.

Tree View

| Order | Name | Status | Details |
|-------|-------------------|------------------------|---------|
| 1 | Precode | Completed successfully | |
| 2 | Join | Completed successfully | |
| 3 | Postcode | Completed successfully | |
| | Load SubjectsInfo | Completed successfully | |

Completed successfully

Job Editor

The screenshot displays the SAS Data Integration Studio 4.9 - CDI User interface. The main window is titled "Load SubjectsInfo" and contains a flow diagram. The diagram shows two input nodes, "SUBJECTS" and "TreatmentGroups", connected to a "Join" node (labeled with a circled 1). The output of the "Join" node is a "SubjectInfo" node. The "Job Editor" window is highlighted with a red border. A green callout box with the text "Job Editor" and an arrow points to the "SUBJECTS" node in the diagram.

Job Editor

Diagram

Details

Status | Warnings and Errors | Statistics | Control Flow

Last Run: Apr 16, 2015 10:27:29 AM Clear All

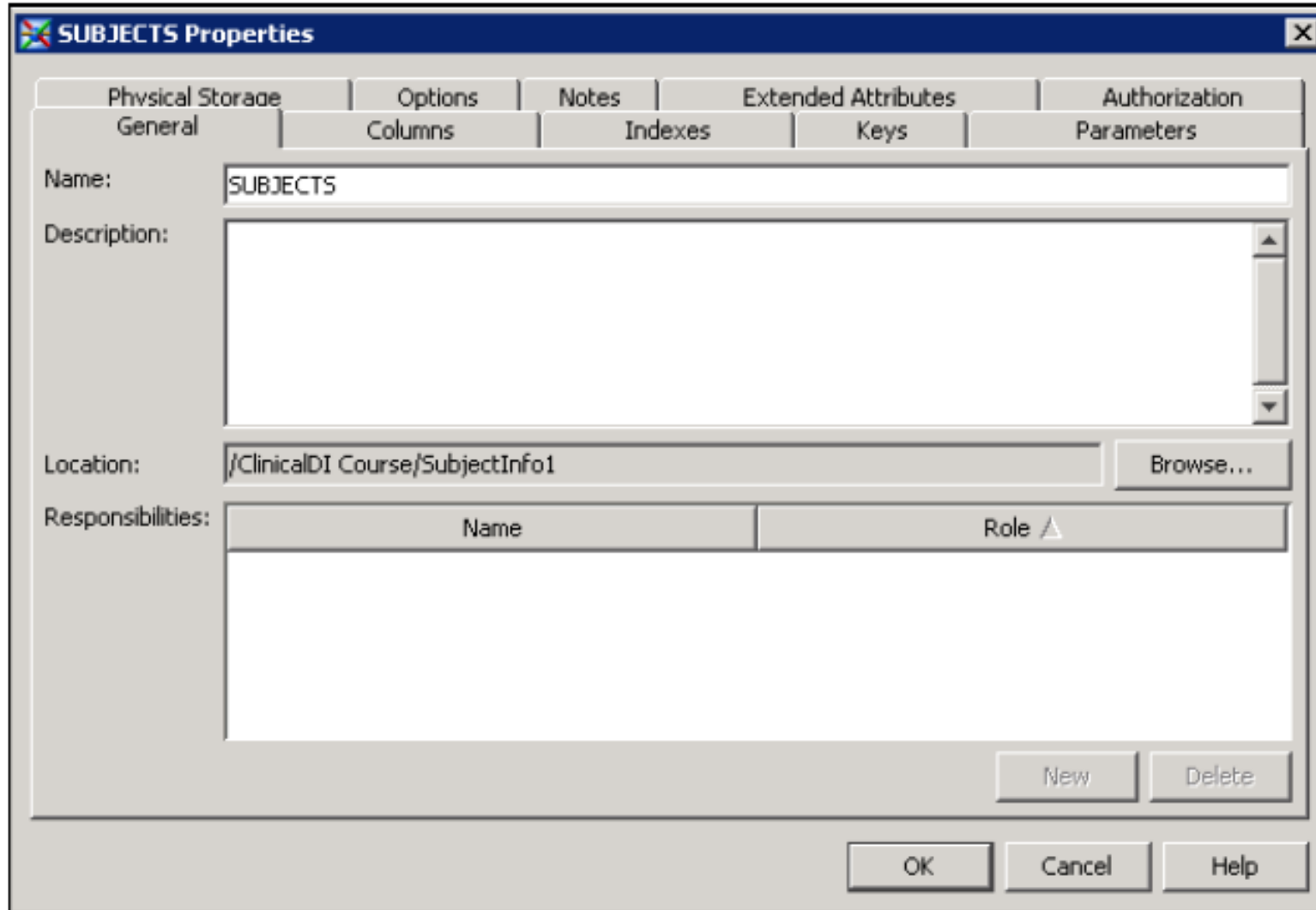
| Order | Name | Status | Details |
|-------|-------------------|------------------------|---------|
| 1 | Precode | Completed successfully | |
| 2 | Join | Completed successfully | |
| 3 | Postcode | Completed successfully | |
| | Load SubjectsInfo | Completed successfully | |

Completed successfully

SASApp cdiuser@SASBAP as CDI User sasbap : 8561



Object properties

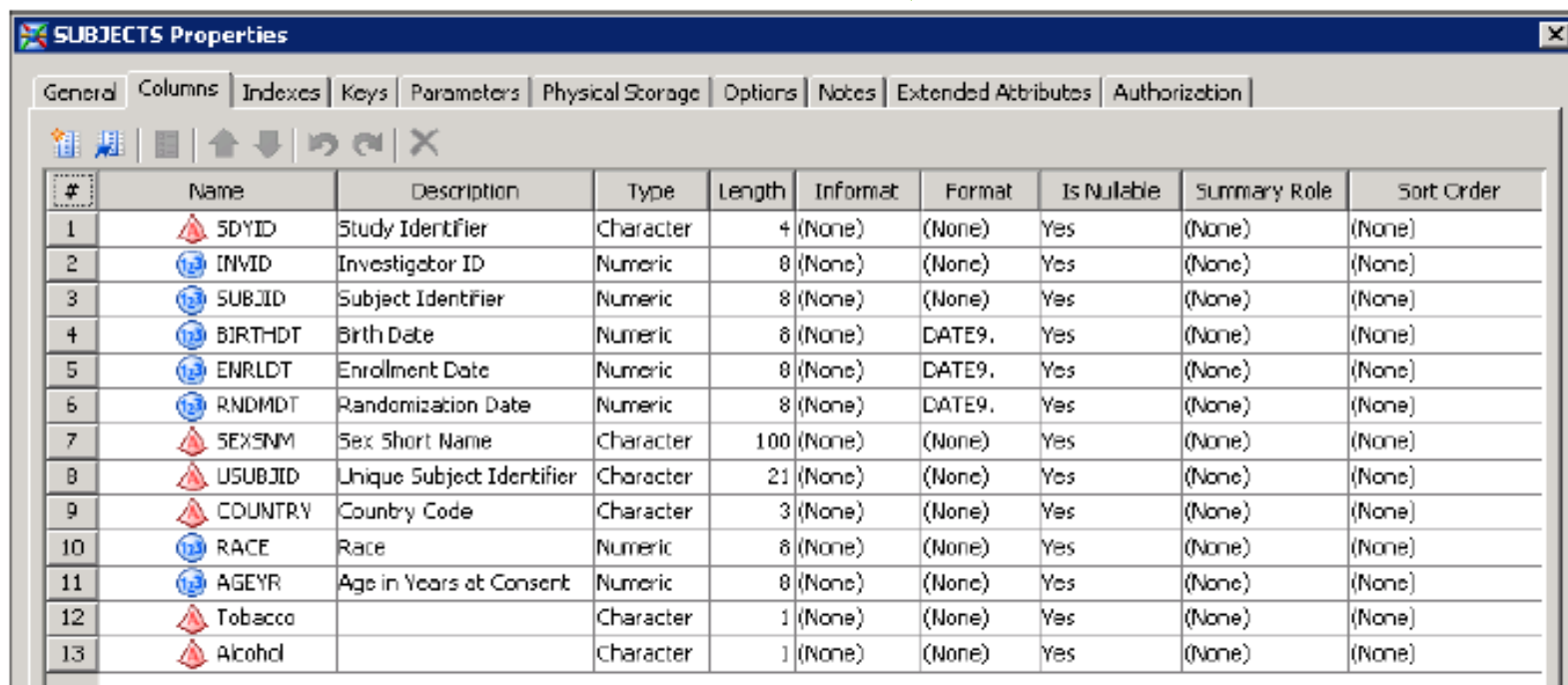


The image shows a Windows-style dialog box titled "SUBJECTS Properties". It has a tabbed interface with the following tabs: Physical Storage, Options, Notes, Extended Attributes, Authorization, General, Columns, Indexes, Keys, and Parameters. The "General" tab is currently selected. Inside the "General" tab, there are several fields: "Name:" with the value "SUBJECTS", "Description:" with an empty text area, "Location:" with the value "/ClinicalDI Course/SubjectInfo1" and a "Browse..." button, and "Responsibilities:" with a table. The table has two columns: "Name" and "Role". At the bottom right of the dialog are buttons for "New", "Delete", "OK", "Cancel", and "Help".

| Name | Role ▲ |
|------|--------|
|------|--------|



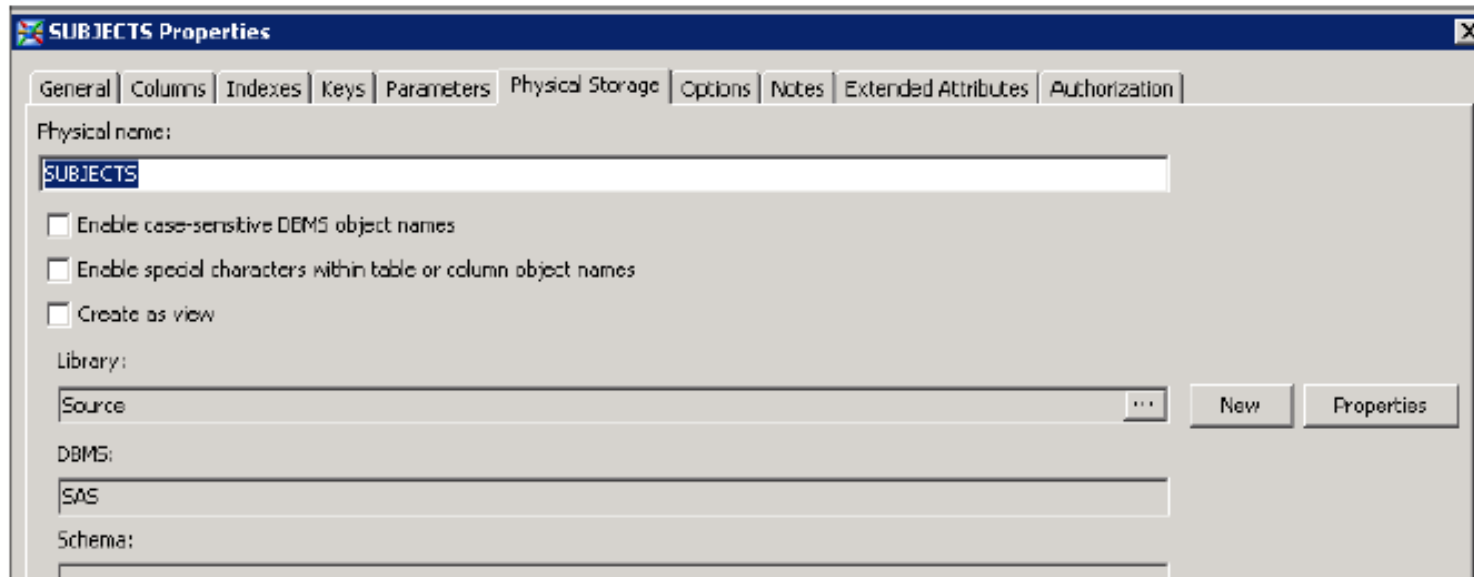
Object properties



The screenshot shows the 'SUBJECTS Properties' dialog box with the 'Columns' tab selected. The table below represents the data shown in the dialog.

| # | Name | Description | Type | Length | Informat | Format | Is Nullable | Summary Role | Sort Order |
|----|---------|---------------------------|-----------|--------|----------|--------|-------------|--------------|------------|
| 1 | SDYID | Study Identifier | Character | 4 | (None) | (None) | Yes | (None) | (None) |
| 2 | INVID | Investigator ID | Numeric | 8 | (None) | (None) | Yes | (None) | (None) |
| 3 | SUBJID | Subject Identifier | Numeric | 8 | (None) | (None) | Yes | (None) | (None) |
| 4 | BIRTHDT | Birth Date | Numeric | 8 | (None) | DATE9. | Yes | (None) | (None) |
| 5 | ENRLDT | Enrollment Date | Numeric | 8 | (None) | DATE9. | Yes | (None) | (None) |
| 6 | RNDMDT | Randomization Date | Numeric | 8 | (None) | DATE9. | Yes | (None) | (None) |
| 7 | SEXSNM | Sex Short Name | Character | 100 | (None) | (None) | Yes | (None) | (None) |
| 8 | USUBJID | Unique Subject Identifier | Character | 21 | (None) | (None) | Yes | (None) | (None) |
| 9 | COUNTRY | Country Code | Character | 3 | (None) | (None) | Yes | (None) | (None) |
| 10 | RACE | Race | Numeric | 8 | (None) | (None) | Yes | (None) | (None) |
| 11 | AGEYR | Age in Years at Consent | Numeric | 8 | (None) | (None) | Yes | (None) | (None) |
| 12 | Tobacco | | Character | 1 | (None) | (None) | Yes | (None) | (None) |
| 13 | Alcohol | | Character | 1 | (None) | (None) | Yes | (None) | (None) |

Object properties



The screenshot shows a Windows-style dialog box titled "SUBJECTS Properties". It has a tabbed interface with the following tabs: General, Columns, Indexes, Keys, Parameters, Physical Storage, Options, Notes, Extended Attributes, and Authorization. The "General" tab is currently selected. Inside the dialog, there is a "Physical name:" label followed by a text box containing the word "SUBJECTS". Below this, there are three unchecked checkboxes: "Enable case-sensitive DBMS object names", "Enable special characters within table or column object names", and "Create as view". Further down, there is a "Library:" label followed by a text box containing the word "Source". To the right of this text box are three buttons: an ellipsis button "...", a "New" button, and a "Properties" button. Below the "Library:" section, there are two more text boxes: one labeled "DBMS:" containing the word "SAS", and another labeled "Schema:" which is currently empty.

SUBJECTS Properties

General | Columns | Indexes | Keys | Parameters | Physical Storage | Options | Notes | Extended Attributes | Authorization

Physical name:
SUBJECTS

☐ Enable case-sensitive DBMS object names
☐ Enable special characters within table or column object names
☐ Create as view

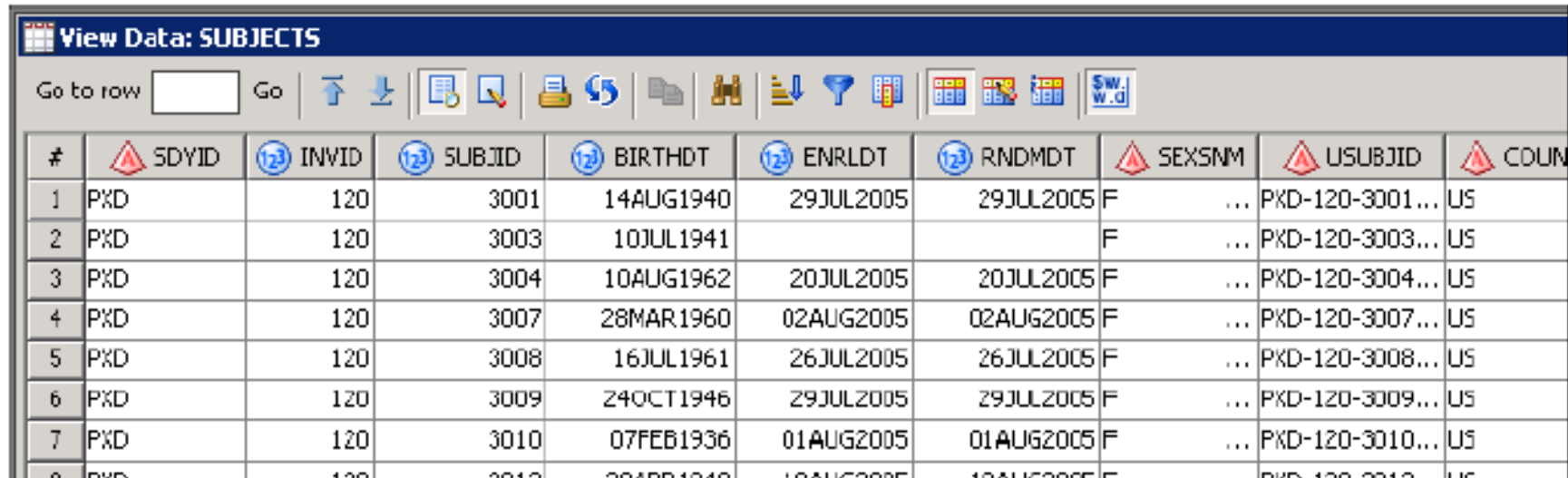
Library:
Source ... New Properties

DBMS:
SAS

Schema:



View data window

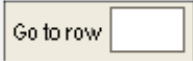











| # | SDYID | INVID | SUBJID | BIRTHDT | ENRLDT | RNDMDT | SEXSNM | USUBJID | COUN |
|---|-------|-------|--------|-----------|-----------|-----------|--------|-----------------|------|
| 1 | PXD | 120 | 3001 | 14AUG1940 | 29JUL2005 | 29JUL2005 | F | PKD-120-3001... | US |
| 2 | PXD | 120 | 3003 | 10JUL1941 | | | F | PKD-120-3003... | US |
| 3 | PXD | 120 | 3004 | 10AUG1962 | 20JUL2005 | 20JUL2005 | F | PKD-120-3004... | US |
| 4 | PXD | 120 | 3007 | 28MAR1960 | 02AUG2005 | 02AUG2005 | F | PKD-120-3007... | US |
| 5 | PXD | 120 | 3008 | 16JUL1961 | 26JUL2005 | 26JUL2005 | F | PKD-120-3008... | US |
| 6 | PXD | 120 | 3009 | 24OCT1946 | 29JUL2005 | 29JUL2005 | F | PKD-120-3009... | US |
| 7 | PXD | 120 | 3010 | 07FEB1936 | 01AUG2005 | 01AUG2005 | F | PKD-120-3010... | US |
| 8 | PXD | 120 | 3012 | 08APR1940 | 10AUG2005 | 10AUG2005 | F | PKD-120-3012... | US |

The functions of the View Data window are controlled by the View Data toolbar










View data window

| TOOL | EXPLANATION |
|---|---|
|  | Specifies the number of the first row that is displayed in the table. |
|  | Positions the data with the go-to row as the first data line displayed. |
|  | Navigates to the first record of data in the View Data window. |
|  | Navigates to the last page of data in the View Data window. |
|  | Switches to Browse mode. |
|  | Switches to Edit mode. |
|  | Enables printing. |
|  | Refreshes the view of the data. |
|  | Copies selected data values to the clipboard. |
|  | Displays the Search area. |

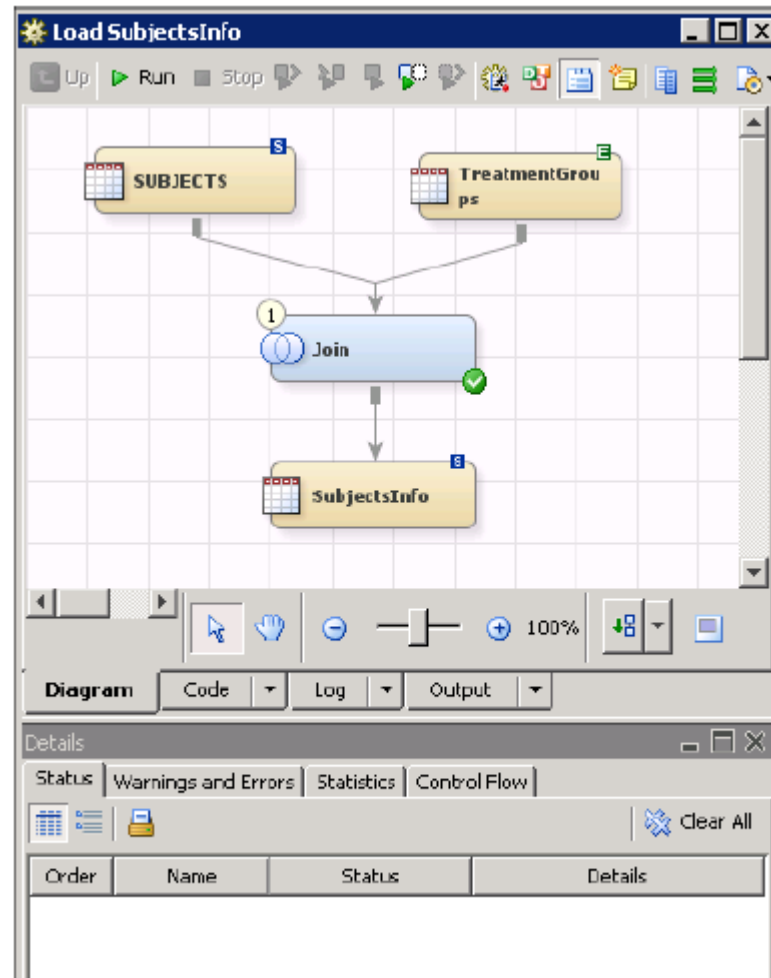


View data window

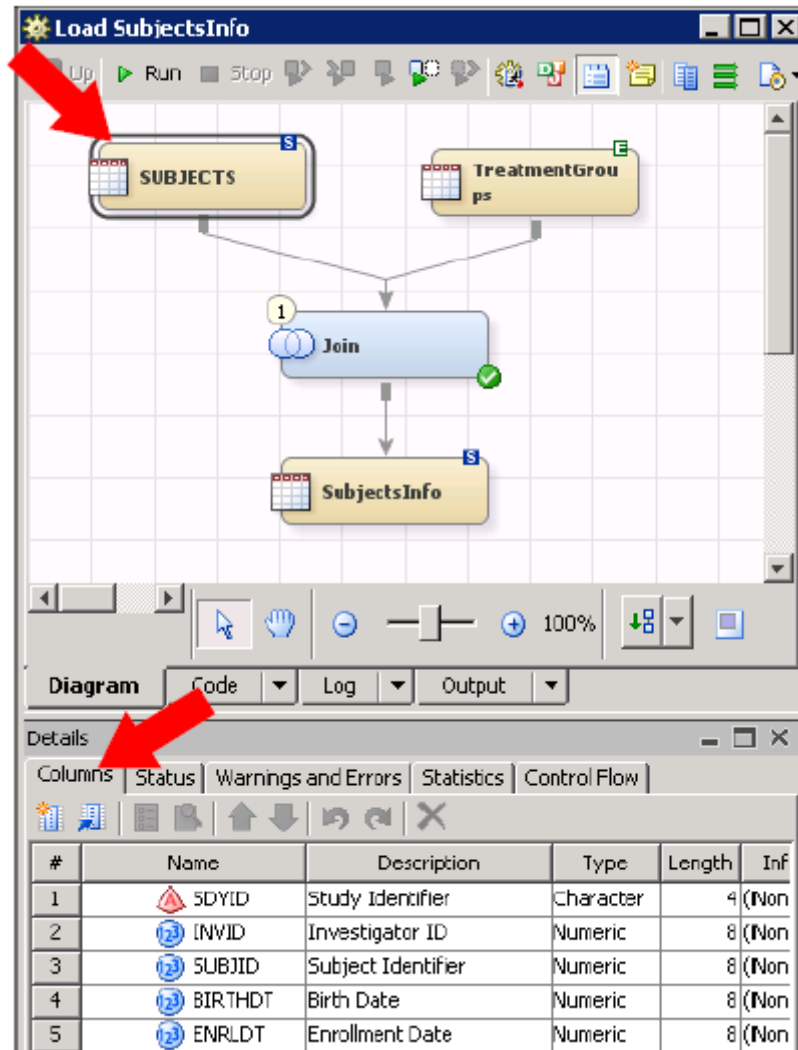
| | |
|---|--|
|  | Displays the Sort By Column tab in the View Data Options window. |
|  | Displays the Filter tab in the View Data Options window. |
|  | Displays the Columns tab in the View Data Options window. |
|  | Displays physical column names in the column headings. You can display any combination of column metadata, physical column names, and descriptions in the column headings. |
|  | Displays optional descriptions in the column headings. |
|  | Displays optional column metadata in the column headings. This metadata can be entered in some SAS Intelligence Platform applications, such as SAS Information Map Studio. |
|  | Toggles between showing formatted and unformatted data in the View Data window. |



Jobs



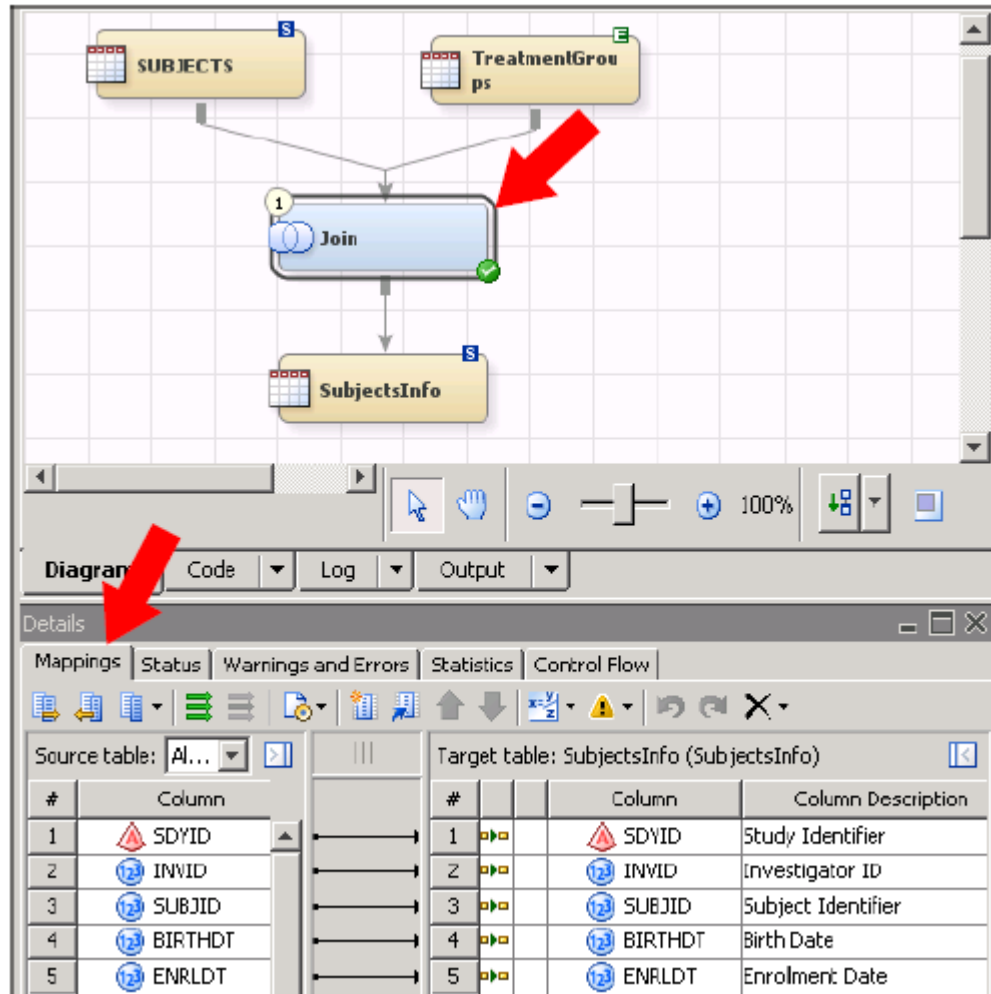
Jobs



The column tab in the Details area displays column attributes for the selected table object.

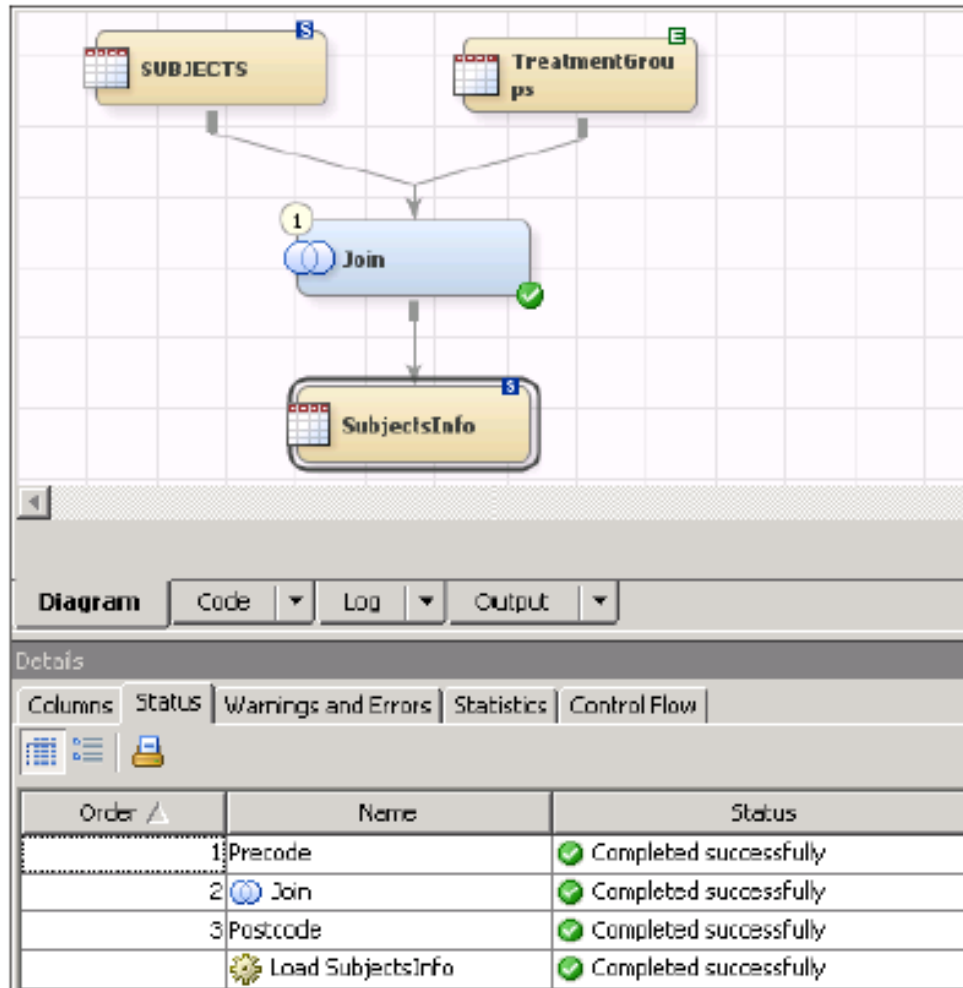
These attributes are fully editable in this location

Jobs



The Mappings tab provides control for how columns from source tables are propagated and mapped to target tables

Jobs

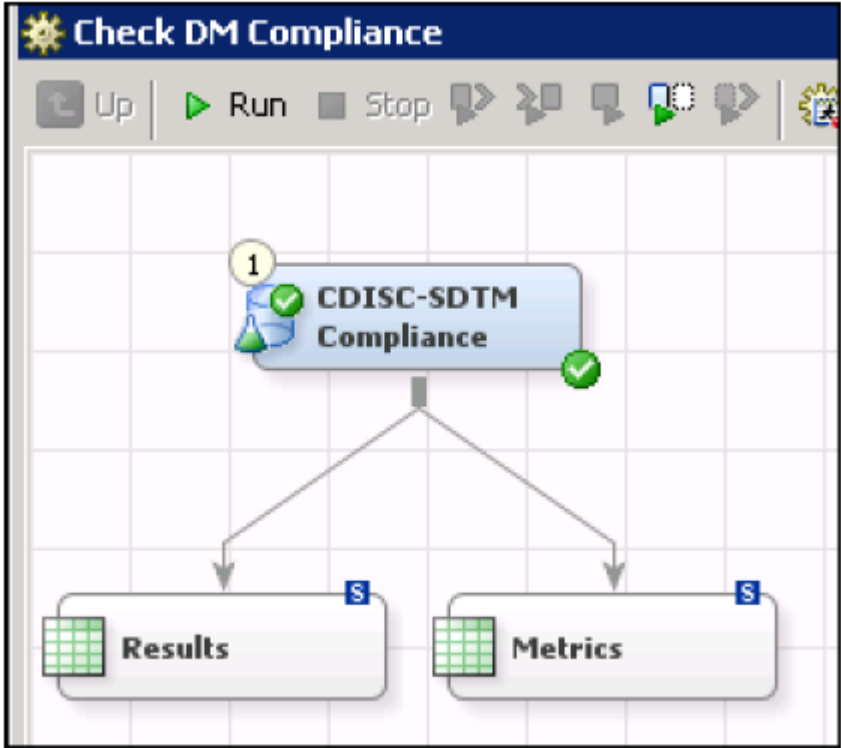
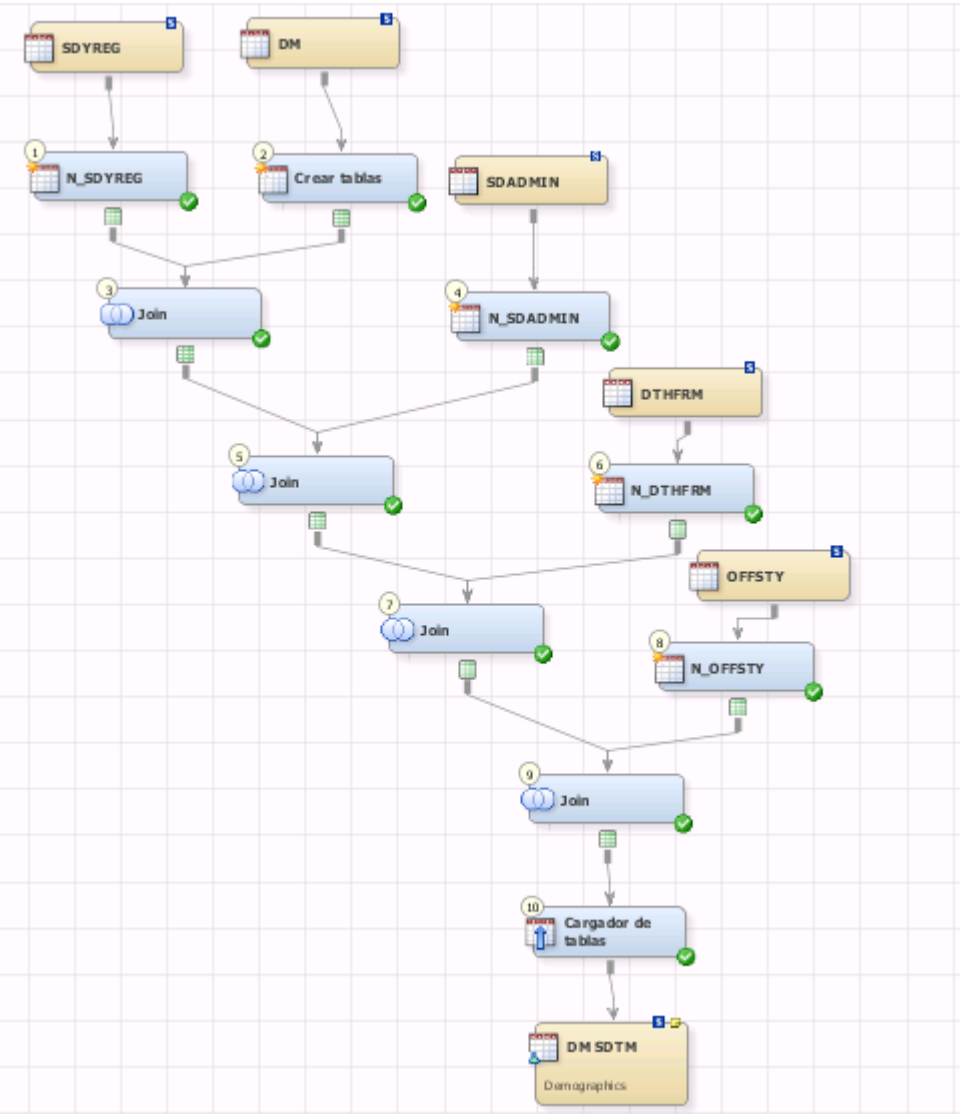


After run the job by clicking “RUN”, the Status tab indicate that the job completed without generating any errors or warnings

Code tab shows the code generated by the transformation

Log tab shows the log

DM domain mapping example



The background is a blue-tinted photograph of a city street. On the left, a large, ornate building with a statue on its rooftop is visible. The street is lined with other buildings, and there are trees and streetlights in the foreground. The overall scene is a classic urban setting.

 **Thank you**