Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

# Module 5
# Architectures, Features, and Details of Data Integration Tools

## Lesson 4: Pentaho Data Integration

# Lesson Objectives

- List major features of Pentaho Data Integration
- Gain familiarity with Pentaho features for jobs and transformations
- Gain experience with Pentaho on the practice exercise and assignment

# Pentaho Products

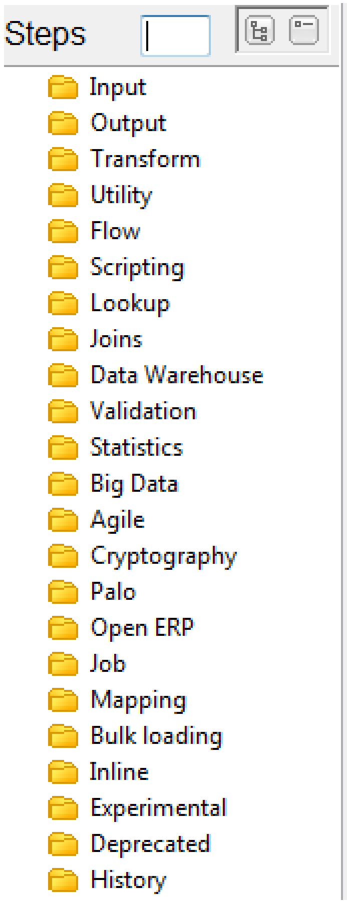
- Platform for data integration, business analytics, and big data
- Open core business model
- Pentaho Data Integration
- Pentaho Business Analytics
- Pentaho Big Data Analytics

# Pentaho Data Integration

- Editions
  - Subscription service from Pentaho website
  - Community edition: Kettle
- Basic concepts
  - Transformation with data flow among steps and hops
  - Job with data flow among transformations and external entities
- Tools:
  - Spoon: graphical design of transformations and jobs
  - Pan and Kitchen: execution of transformations and jobs

# Transformations

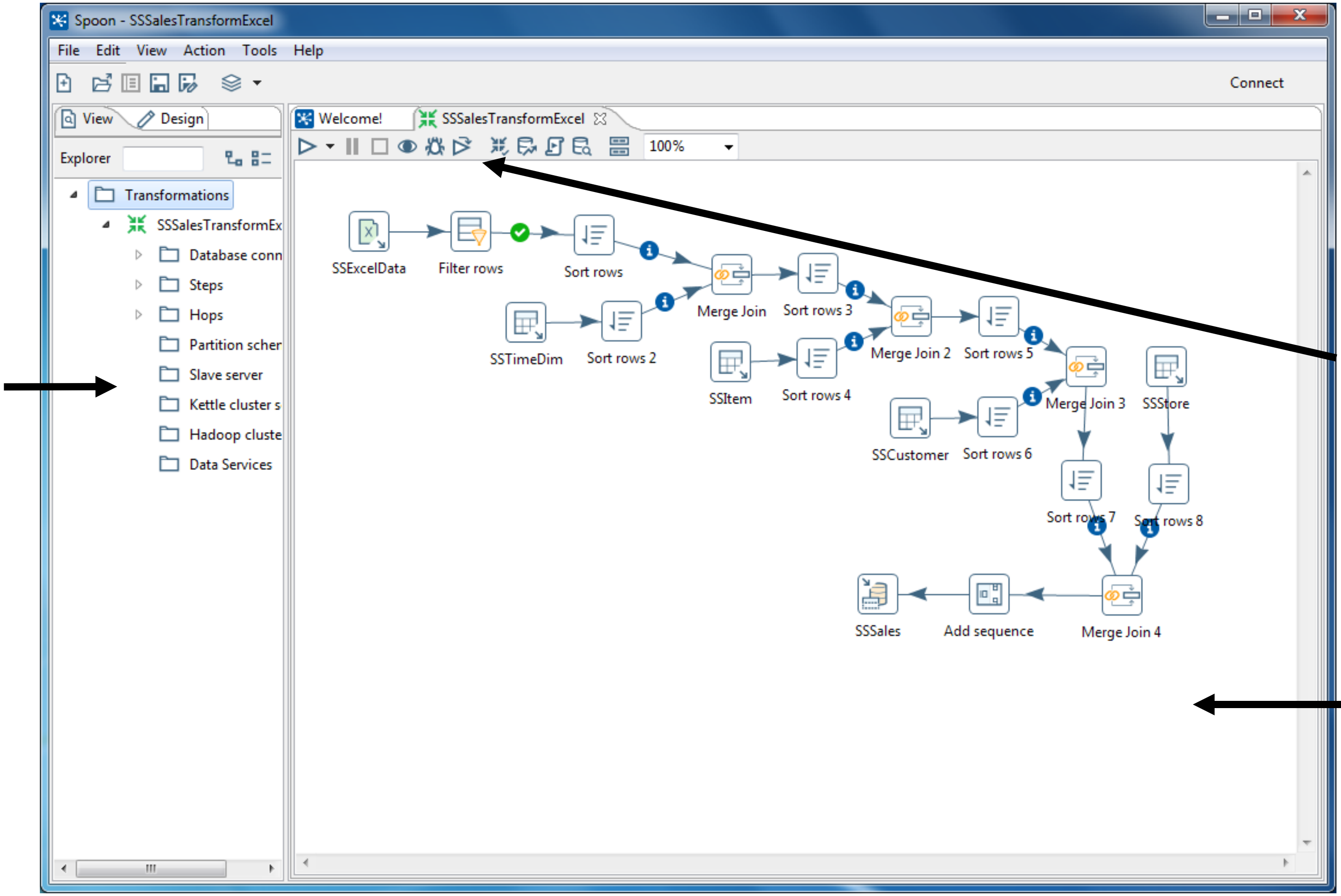
- Step: process in a data flow
  - Input/Output
  - Transform: sort, split, concatenate, …
  - Flow: filter rows
  - Lookup: existence of rows, tables, files, …
  - Join: merge join, multiway merge, …
  - Validation: credit card, mail, data
- Hop: directed connection between steps
- Database connections
- Distributed processing: partition, cluster, …



Steps

- Input
- Output
- Transform
- Utility
- Flow
- Scripting
- Lookup
- Joins
- Data Warehouse
- Validation
- Statistics
- Big Data
- Agile
- Cryptography
- Palo
- Open ERP
- Job
- Mapping
- Bulk loading
- Inline
- Experimental
- Deprecated
- History

# Spoon IDE

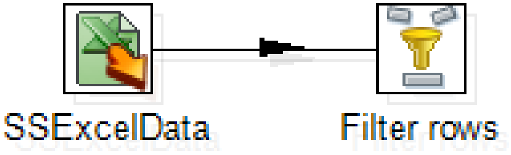


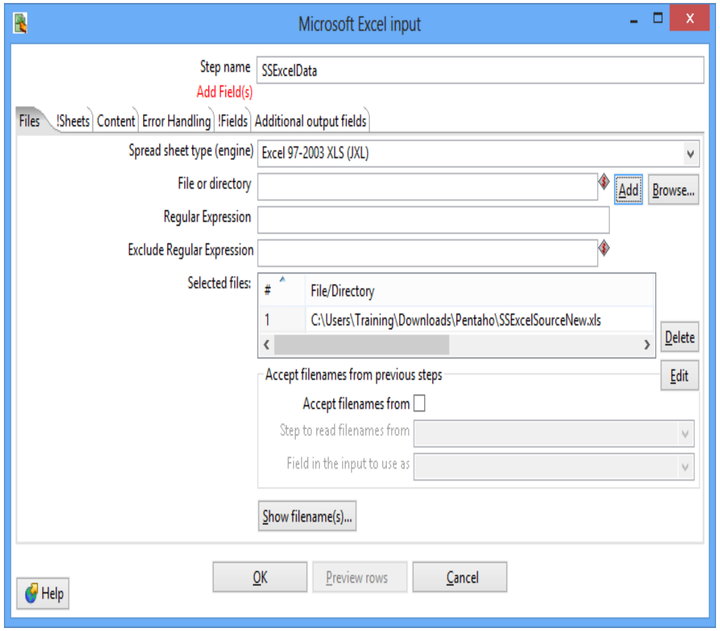
View pane

Execution controls

Canvas

# Example Transformations





Step name: SSExcelData

Spread sheet type (engine): Excel 97-2003 XLS (JXL)

File or directory:

Regular Expression:

Exclude Regular Expression:

Selected files:

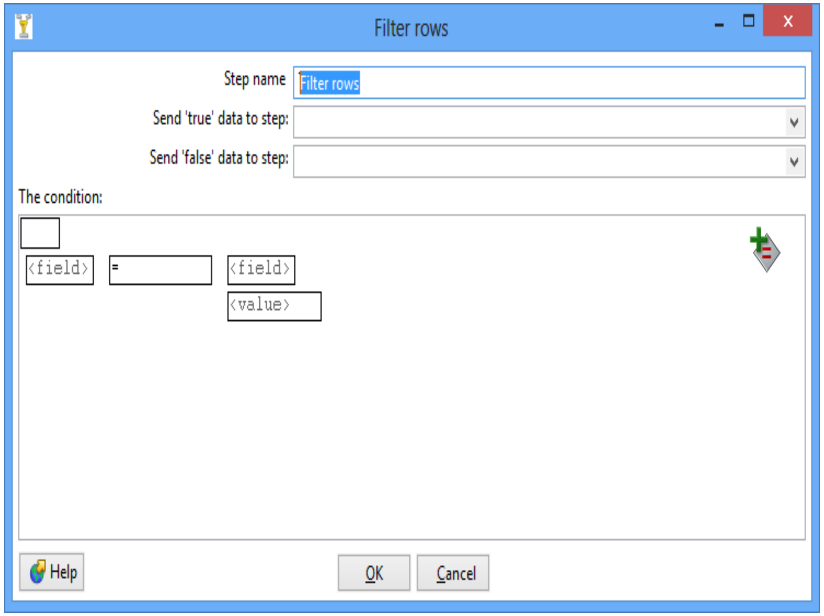
| # | File/Directory |
|---|---|
| 1 | C:\Users\Training\Downloads\Pentaho\SSExcelSourceNew.xls |

Accept filenames from previous steps

Accept filenames from ☐

Step to read filenames from:

Field in the input to use as:



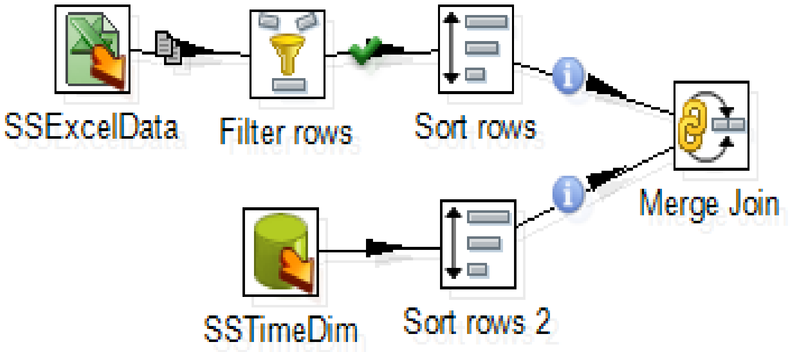
Step name: Filter rows

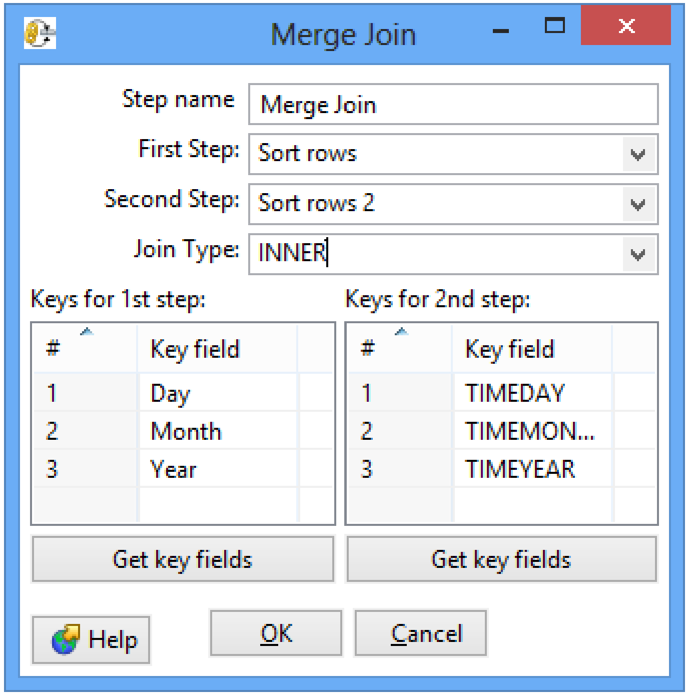
Send 'true' data to step:

Send 'false' data to step:

The condition:

# Merge Join Step





Step name: Merge Join

First Step: Sort rows

Second Step: Sort rows 2

Join Type: INNER

Keys for 1st step:

| # | Key field |
|---|---|
| 1 | Day |
| 2 | Month |
| 3 | Year |

Keys for 2nd step:

| # | Key field |
|---|---|
| 1 | TIMEDAY |
| 2 | TIMEMON... |
| 3 | TIMEYEAR |

# Summary

- Prominent open source tools (Talend and Pentaho)
- Community and subscription editions
- Supports specification of transformations and steps and transformation execution
- Use Pentaho for exercise and assignment

# Talend versus Pentaho

- Pentaho advantages
  - Incremental execution
  - Easier to export
  - Easier reuse of database connections
- Talend advantages
  - More compact specification especially for multiple joins and not null checks
  - HTML documentation generation