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DATA PREP TIPS FOR BI PLATFORMS

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OVERVIEW

Business intelligence (BI) platforms such as Tableau, Power BI, and Qlik (and many others) provide tools that enable organizations to more easily identify insightful patterns in their data. Although they all read common formats like Excel and CSV, to take full advantage of their power, the data should be formatted in a certain way.

Tips:

1. Merge and/or append data that is spread across multiple sources into a single dataset.
2. Consolidate columns as much as possible. For instance, if a dataset has a column for each individual month, the data will work better in a BI application if these columns are condensed into two columns that represent Month and Value.
3. Eliminate rows and columns representing totals.
4. Create column headers that are unique and descriptive.
5. Eliminate duplicate headers, merged cells and nested tables.

These challenges can be resolved using Excel or data preparation tools within the BI platform. However, manual alterations to data can risk introducing errors, and for situations where many changes are required, repetitive steps can become tedious. FME® can execute the same tasks for data preparation in an automated, repeatable way. This guide will outline a few tips for preparing tabular data for business intelligence platforms with FME®.

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A Note on Language in FME

When working in FME and reading its documentation, keep these equivalencies in mind:

Attributes = columns

Features = rows

Feature Types = sheets (tables)

Readers = inputs (data connections)

Writers = outputs

Transformers = data transformations

Non-spatial = tabular

Spatial = lat/longs (mapping data)



FME Tools for Data Prep

Several tools in FME, called transformers, are used frequently for data remodelling tasks.

AttributeManager

Attributes in FME are equivalent to columns in a tabular format like Excel spreadsheets. This transformer enables users to rename, remove or add columns all in one place. Related transformers are the AttributeRenamer, AttributeRemover, and AttributeCreator which individually execute the same tasks as the AttributeManager.

TestFilter

Enables users to filter rows out of a dataset based on conditional formatting rules.

AttributeExploder

When used in conjunction with the TestFilter, this transformer is great for consolidating multiple columns that contain values for the same metric - month or location for instance - into one. It “explodes” a dataset into attribute (column) name and value pairs, listing them in two new columns, with the option to keep all other columns in the output. This will be explained further in the “Consolidate Columns” section.

Sorter

The sorter allows users to sort data based on different criteria.

FME Transformer Gallery

Manipulate your data exactly as needed by using any combination of FME's 450 transformers.

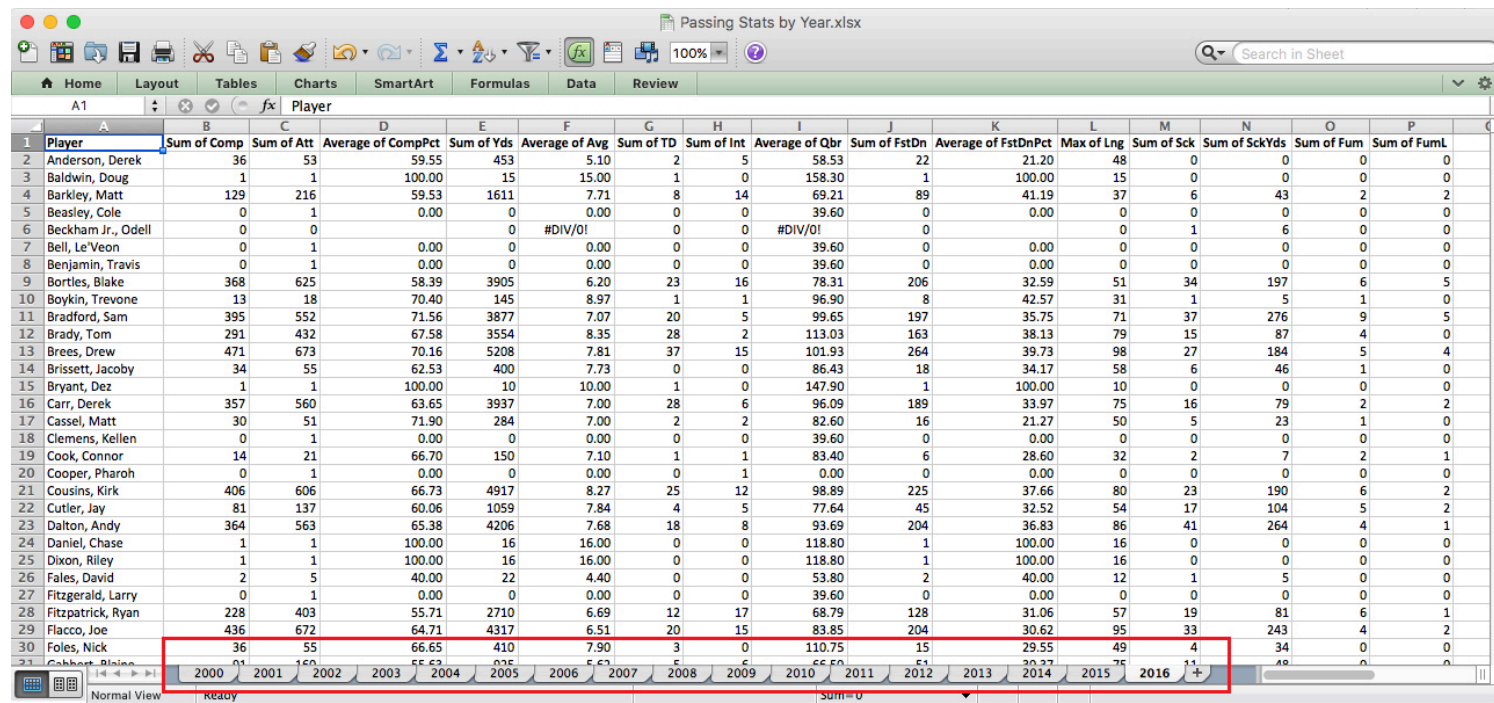
[SAFE.COM/TRANSFORMERS](https://www.safe.com/transformers)

The screenshot displays the FME Transformer Gallery interface. At the top, there is a search bar labeled "Search all transformers..." and two dropdown menus: "Filter By" set to "All Categories" and "Sort By" set to "Most Used". Below these are 16 transformer cards arranged in a 4x4 grid. Each card features a transformer icon, a title, and a brief description of its function.

| Transformer | Description |
|----------------------|---|
| Tester | Evaluates one or more tests on a feature, and routes the feature according to the outcome of the test(s). The tests can consist of any FME-allowed |
| AttributeCreator | Adds one or more attributes to the feature and optionally assigns a value derived from constants, attribute values, and expressions. Values |
| AttributeManager | Alters multiple attributes through adding, renaming, copying, deleting and re-ordering. Sets values for new, existing, and |
| FeatureMerger | Copies and merges the attributes/geometry from one feature (or multiple features) onto another feature (or multiple features). Features |
| Creator | Creates features using the parameters supplied, and sends them into the workspace for processing. |
| Inspector | Sends features to the FME Data Inspector for display. |
| AttributeKeeper | Removes all attributes and list attributes, except the specific ones you specify to be retained. |
| TestFilter | Filters features by test conditions to one or more output ports. |
| Clipper | Performs a geometric clipping operation. |
| Reprojector | Reprojects feature coordinates from one coordinate system to another. |
| AttributeRenamer | Renames one or more attributes, retaining the attribute's current values. |
| Aggregator | Combines feature geometries into heterogeneous or homogeneous aggregates. Alternatively, combines feature attributes without any geometry. |
| AttributeFilter | Routes features to different output ports depending on the value of an attribute. The set of possible attribute values can be entered |
| FeatureReader | Reads features from any FME-supported format. A complete read is done for each feature that enters the Initiator port. The features resulting from |
| VertexCreator | Appends coordinates to null, point, text, line, and arc geometry, or replaces existing geometry with point geometry. |
| AttributeRemover | Removes the selected attributes and list attributes from the feature. |
| StringReplacer | Replaces substrings matching a string or regular expression in the string contained in the source attribute. |
| Counter | Adds a numeric attribute to a feature and assigns a value. Each subsequent feature passing through the transformer receives an incremented value - |
| Bufferer | Expands or shrinks the boundary segments in the input geometry by a specified amount, and if necessary, connects them using stroked arcs. Aggregate |
| StatisticsCalculator | Calculates statistics based on a designated attribute or set of attributes of the incoming features. |

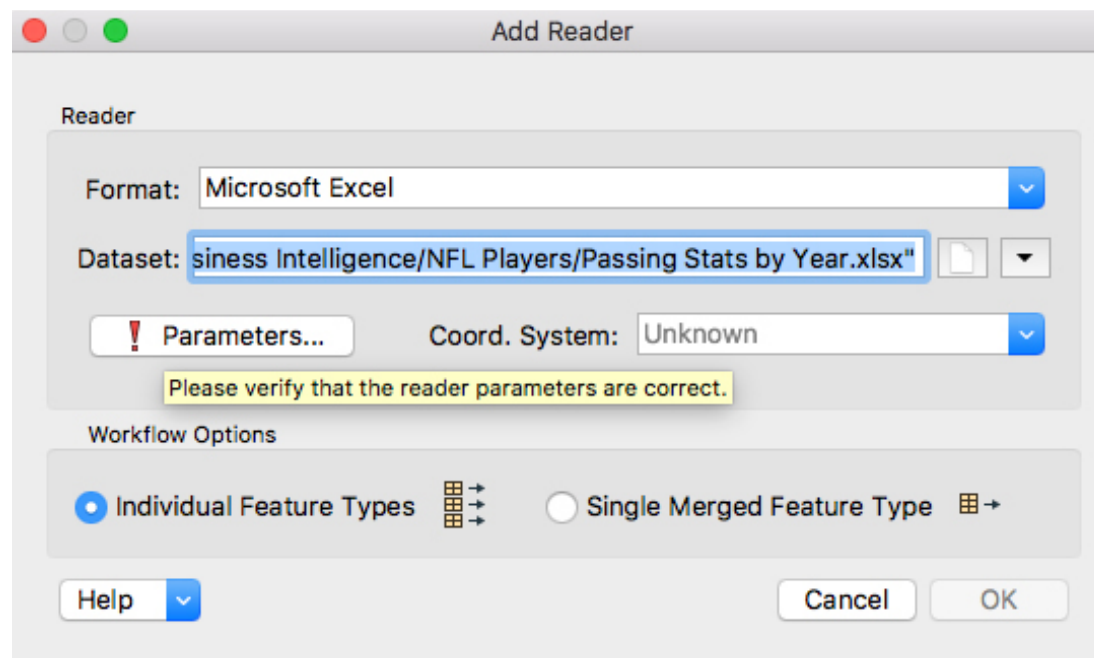
SCENARIO #1 - APPENDING MULTIPLE DATASETS

Oftentimes the data requiring analysis is spread across multiple worksheets because of a unique factor like time or place of collection.

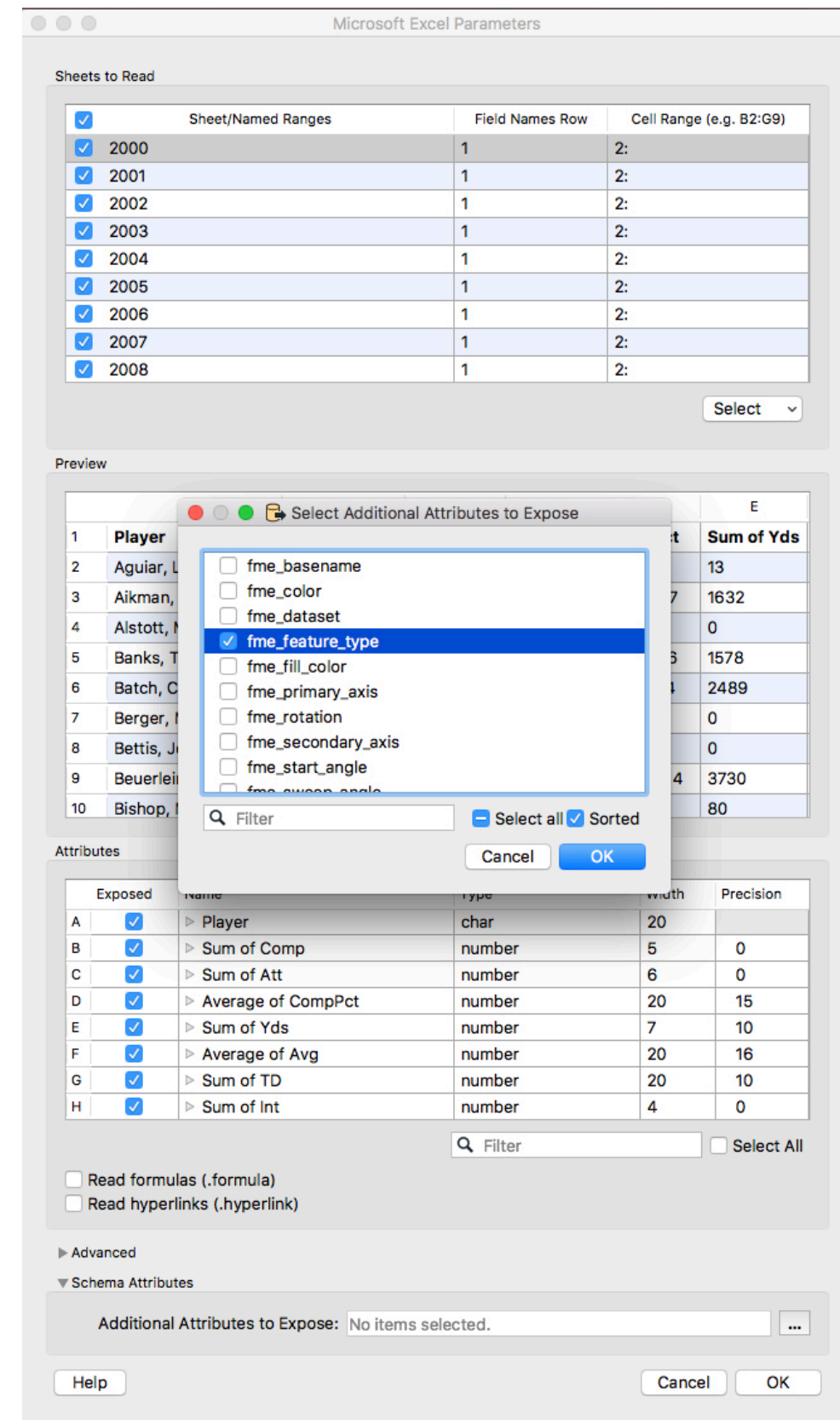


For analysis in a BI platform these sheets need to be appended while adding a column that enables each individual dataset to still be uniquely identified. For example, in the case of this NFL data, by season.

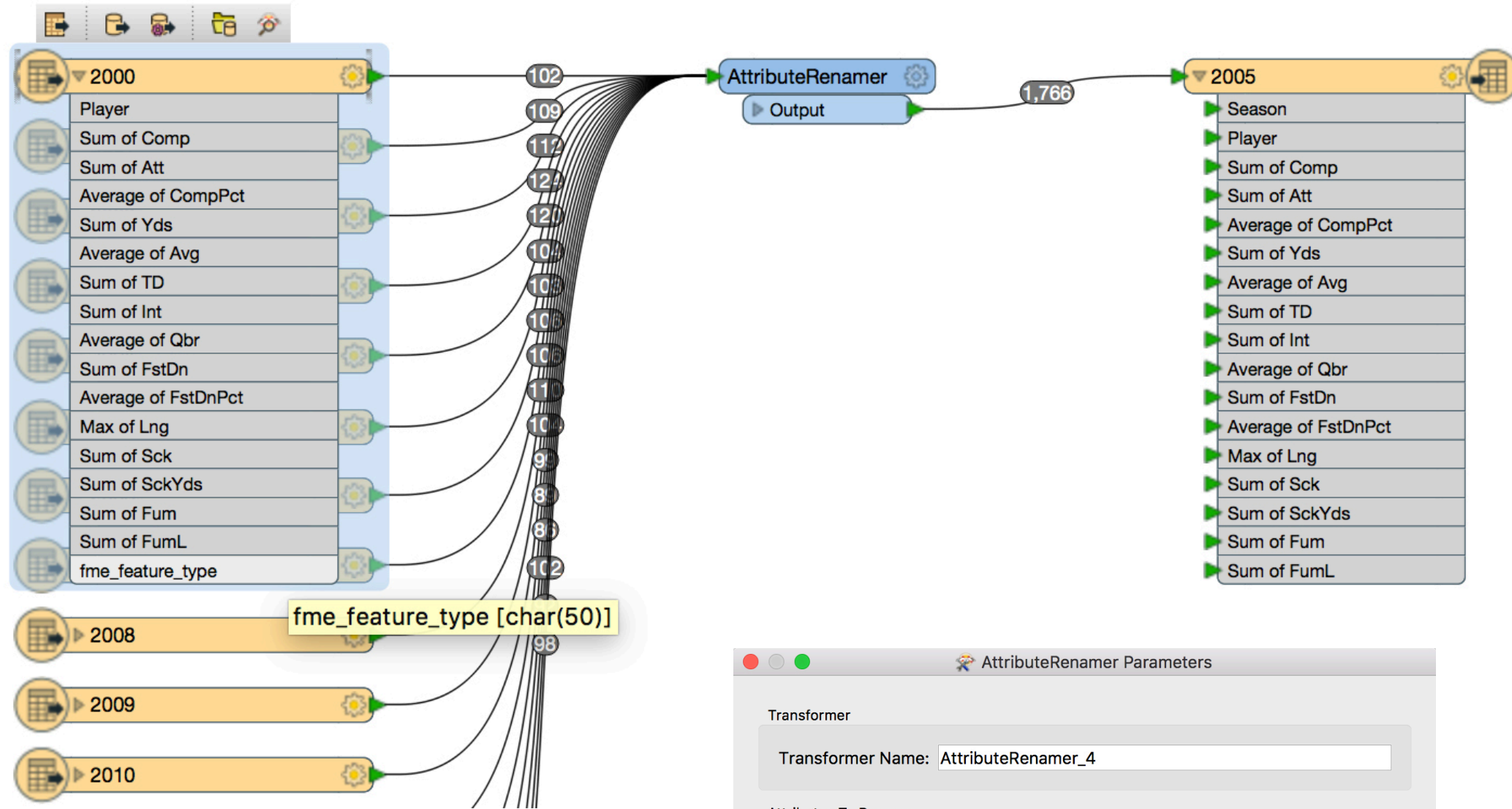
To do this in FME, first add a reader tool to the canvas, find the file and click "Parameters".



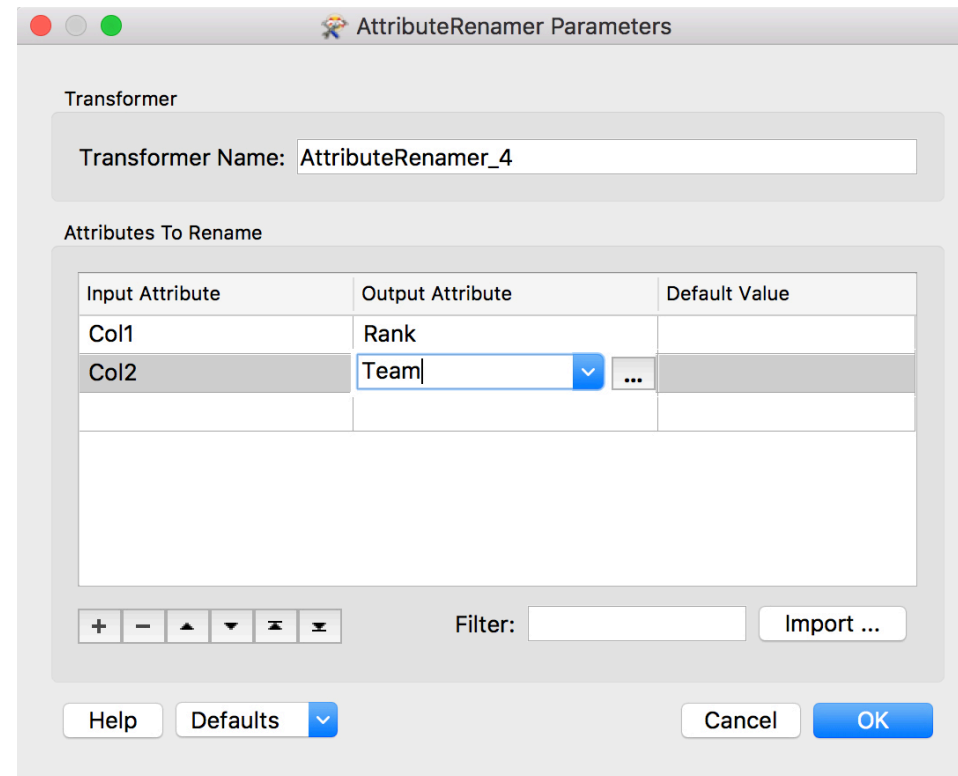
To create a column that identifies which individual sheet the data point originated from, head down to Schema Attributes in the Excel Parameters dialog and click the ellipsis square next to "Additional Attributes to Expose". Select "fme_feature_type".



Back on the canvas, an FME “feature type” has been created for each individual worksheet from Excel. Browse a worksheet’s columns by clicking the arrow next to its name. Observe that a new column has been created that represents the season of the data called “fme_feature_type”.



Change the name of this column to “Year” using the AttributeRenamer tool.



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The appended datasets look like this:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|-----|--------|-------------------|-------------|------------|--------------------|------------|----------------|-----------|------------|----------------|--------------|---------------------|------------|------------|---------------|------------|-------------|
| | Season | Player | Sum of Comp | Sum of Att | Average of CompPct | Sum of Yds | Average of Avg | Sum of TD | Sum of Int | Average of Qbr | Sum of FstDn | Average of FstDnPct | Max of Lng | Sum of Sck | Sum of SckYds | Sum of Fum | Sum of FumL |
| 90 | 2000 | Stewart, Kordell | 151 | 289 | 50.59 | 1860 | 6.02 | 11 | 8 | 72.61 | 91 | 26.15 | 45 | 30 | 150 | 2 | 1 |
| 91 | 2000 | Stoerner, Clint | 3 | 5 | 60.00 | 53 | 10.60 | 1 | 0 | 135.80 | 2 | 40.00 | 29 | 2 | 21 | 0 | 0 |
| 92 | 2000 | Testaverde, Vinny | 328 | 590 | 52.34 | 3732 | 5.86 | 21 | 25 | 66.11 | 179 | 28.03 | 63 | 13 | 71 | 2 | 2 |
| 93 | 2000 | Thomas, Thurman | 0 | 0 | | 0 | | 0 | 0 | | 0 | | 0 | 1 | 2 | 0 | 0 |
| 94 | 2000 | Thompson, Kevin | 1 | 1 | 100.00 | 8 | 8.00 | 0 | 0 | 100.00 | 0 | 0.00 | 8 | 0 | 0 | 0 | 0 |
| 95 | 2000 | Van Pelt, Alex | 4 | 8 | 50.00 | 67 | 8.40 | 0 | 0 | 78.60 | 2 | 25.00 | 36 | 0 | 0 | 0 | 0 |
| 96 | 2000 | Valter, Ken | 0 | 1 | 0.00 | 0 | 0.00 | 0 | 0 | 39.60 | 0 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| 97 | 2000 | Warner, Kurt | 235 | 347 | 67.65 | 3429 | 10.19 | 21 | 18 | 95.75 | 153 | 44.33 | 85 | 20 | 115 | 2 | 0 |
| 98 | 2000 | Williams, Ricky | 1 | 1 | 100.00 | 34 | 34.00 | 0 | 0 | 118.80 | 1 | 100.00 | 34 | 0 | 0 | 0 | 0 |
| 99 | 2000 | Wright, Anthony | 22 | 53 | 42.58 | 237 | 6.13 | 0 | 3 | 49.15 | 10 | 22.50 | 46 | 12 | 92 | 2 | 2 |
| 100 | 2000 | Wycheck, Frank | 2 | 2 | 100.00 | 53 | 26.50 | 1 | 0 | 138.55 | 2 | 100.00 | 30 | 0 | 0 | 0 | 0 |
| 101 | 2000 | Wynn, Spergon | 22 | 54 | 40.67 | 167 | 2.90 | 0 | 1 | 46.67 | 5 | 6.02 | 32 | 13 | 89 | 2 | 2 |
| 102 | 2000 | Zeier, Eric | 3 | 3 | 100.00 | 19 | 6.30 | 0 | 0 | 93.10 | 1 | 33.30 | 14 | 0 | 0 | 0 | 0 |
| 103 | 2000 | Grand Total | 9497 | 16322 | 57.09 | 110131 | 6.92 | 634 | 531 | 77.07 | 5317 | 31.72 | 85 | 1232 | 7525 | 175 | 89 |
| 104 | 2001 | Banks, Tony | 198 | 370 | 53.63 | 2386 | 6.31 | 10 | 10 | 72.45 | 106 | 28.96 | 85 | 29 | 173 | 2 | 2 |
| 105 | 2001 | Batch, Charlie | 198 | 341 | 57.06 | 2392 | 6.80 | 12 | 12 | 72.75 | 107 | 29.20 | 76 | 33 | 176 | 5 | 3 |
| 106 | 2001 | Berger, Mitch | 0 | 1 | 0.00 | 0 | 0.00 | 0 | 0 | 39.60 | 0 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| 107 | 2001 | Bettis, Jerome | 1 | 2 | 50.00 | 32 | 16.00 | 1 | 0 | 98.95 | 1 | 50.00 | 32 | 0 | 0 | 0 | 0 |
| 108 | 2001 | Blake, Jeff | 0 | 1 | 0.00 | 0 | 0.00 | 0 | 0 | 39.60 | 0 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| 109 | 2001 | Bledsoe, Drew | 40 | 66 | 61.10 | 400 | 6.00 | 2 | 2 | 71.95 | 18 | 26.05 | 58 | 5 | 21 | 0 | 0 |
| 110 | 2001 | Booker, Marty | 1 | 2 | 50.00 | 34 | 17.00 | 1 | 0 | 98.95 | 1 | 50.00 | 34 | 0 | 0 | 0 | 0 |
| 111 | 2001 | Bouman, Todd | 51 | 89 | 47.68 | 795 | 6.58 | 8 | 4 | 83.66 | 32 | 22.76 | 80 | 4 | 27 | 0 | 0 |
| 112 | 2001 | Brady, Tom | 264 | 413 | 63.74 | 2843 | 6.82 | 18 | 12 | 85.99 | 143 | 34.50 | 91 | 41 | 216 | 9 | 2 |
| 113 | 2001 | Brees, Drew | 15 | 27 | 55.60 | 221 | 8.20 | 1 | 0 | 94.80 | 11 | 40.70 | 40 | 2 | 12 | 2 | 0 |
| 114 | 2001 | Brooks, Aaron | 312 | 558 | 56.90 | 3832 | 7.01 | 26 | 22 | 78.86 | 183 | 33.45 | 63 | 50 | 330 | 4 | 0 |
| 115 | 2001 | Brown, Travis | 15 | 33 | 45.50 | 201 | 6.10 | 1 | 2 | 50.20 | 11 | 33.30 | 34 | 1 | 2 | 1 | 0 |
| 116 | 2001 | Brunell, Mark | 289 | 473 | 61.28 | 3309 | 6.96 | 19 | 13 | 82.87 | 164 | 33.77 | 44 | 57 | 387 | 7 | 3 |
| 117 | 2001 | Carter, Quincy | 90 | 176 | 48.08 | 1072 | 5.69 | 5 | 7 | 62.06 | 46 | 24.26 | 64 | 12 | 56 | 2 | 0 |
| 118 | 2001 | Chandler, Chris | 223 | 365 | 62.06 | 2847 | 7.86 | 16 | 14 | 81.90 | 127 | 34.66 | 94 | 41 | 261 | 4 | 1 |
| 119 | 2001 | Collins, Kerry | 327 | 568 | 56.84 | 3764 | 6.59 | 19 | 16 | 76.48 | 189 | 33.21 | 76 | 36 | 206 | 10 | 4 |
| 120 | 2001 | Collins, Todd | 3 | 4 | 75.00 | 40 | 10.00 | 0 | 0 | 106.30 | 1 | 25.00 | 26 | 0 | 0 | 0 | 0 |
| 121 | 2001 | Couch, Tim | 272 | 454 | 60.04 | 3040 | 6.81 | 17 | 21 | 75.75 | 134 | | | | | 4 | 1 |
| 122 | 2001 | Craig, Dameyune | 4 | 8 | 50.00 | 34 | 4.30 | 0 | 0 | 61.50 | 2 | | | | | 0 | 0 |
| 123 | 2001 | Culpepper, Daunte | 235 | 366 | 64.63 | 2612 | 7.27 | 14 | 13 | 83.88 | 126 | | | | | 9 | 5 |

Note: This will only work in FME if worksheets are named uniquely.

SCENARIO #2

CONSOLIDATE COLUMNS

Business intelligence platforms do not work well with cross-table formatting, and columns need to be consolidated as much as possible.

| Player | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Addai, Joseph | | | | | | | 0 | | | 0 | | | |
| Aguiar, Louie | 0 | | | | | | | | | | | | |
| Aikman, Troy | 2 | | | | | | | | | | | | |
| Akers, David | | | | | | | 0 | | | | | 0 | |
| Alexander, Danario | | | | | | | | | | | | | 0 |
| Allen, James | | | 0 | | | | | | | | | | |
| Alstott, Mike | 0 | | | | | | | | | | | | |
| Amendola, Danny | | | | | | | | | | | | | |
| Anderson, Derek | | | | | | | 1 | 3 | 4 | 3 | 5 | | 0 |
| Anderson, Richie | | | 0 | 0 | 0 | | | | | | | | |
| Andrews, Antonio | | | | | | | | | | | | | |
| Anger, Bryan | | | | | | | | | | | | | |
| Arrington, J.J. | | | | | | | | | 0 | | | | |
| Austin, Tavon | | | | | | | | | | | | | |

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In the case of this table, a player's passing stat is displayed in a column for each season. To consolidate these columns - also sometimes referred to as "unpivoting" - into one "Season" column in FME, connect an AttributeExploder to the Reader. The AttributeExploder splits your data into two columns: attribute names and attribute values, and writes a row for each name-value pair.

For this particular dataset we are interested in the Season-Yards data for each player. In the AttributeExploder Parameters dialog, set the Attribute Name Label to "Seasons" and the Attribute Value Label to "Yards". Then set "Keep Attributes" to Yes. This keeps the column with the players' names in the table.

Here's what comes out of the AttributeExploder:

Table View

Table: no-conn-ffs-1508275334897_25716 [FFS] - AttributeExploder_OUTPUT Columns...

| | Season | Player | Yards | 2003 | 2000 | 2016 | 2005 | 2011 | 2007 | 2002 | 2004 | 2008 | 2012 | 2010 |
|----|-------------|---------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|
| 1 | Player | Addai, Joseph | Addai, Joseph | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 2 | xlsx_row_id | Addai, Joseph | 2 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 3 | 2006 | Addai, Joseph | 0 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 4 | fme_type | Addai, Joseph | fme_no_geom | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 5 | 2009 | Addai, Joseph | 22 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 6 | Player | Aguiar, Louie | Aguiar, Louie | <missing> | 13 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 7 | xlsx_row_id | Aguiar, Louie | 3 | <missing> | 13 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 8 | 2000 | Aguiar, Louie | 13 | <missing> | 13 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 9 | fme_type | Aguiar, Louie | fme_no_geom | <missing> | 13 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 10 | Player | Aikman, Troy | Aikman, Troy | <missing> | 1632 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 11 | xlsx_row_id | Aikman, Troy | 4 | <missing> | 1632 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 12 | 2000 | Aikman, Troy | 1632 | <missing> | 1632 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |
| 13 | fme_type | Aikman, Troy | fme_no_geom | <missing> | 1632 | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missing> | <missi |

in any column 3494 row(s)

From here, use a TestFilter to eliminate any rows that have a value in the "Season" column that don't represent a year.

The image shows two overlapping dialog boxes from a data tool. The background window is 'TestFilter Parameters', showing a transformer named 'TestFilter' with a table of test conditions. The foreground window is 'Test Conditions', showing configuration for a single test clause.

TestFilter Parameters (Background):

| Test Condition | Output |
|---------------------------------|----------------|
| If @Value(Season) BEGINS_WITH 2 | @Value(Season) |
| Else If | |
| Else <All Other Conditions> | <UNFILTERED> |

Test Conditions (Foreground):

Pass Criteria: One Test (OR)

Composite Expression:

| Left Value | Operator | Right Value | Negate | Mode |
|------------|-------------|-------------|--------------------------|-----------|
| 1 Season | Begins With | 2 | <input type="checkbox"/> | Automatic |

Output Port: @Value(Season) BEGINS_WITH 2

Here is what the data looks like coming out of the TestFilter:

| | A | B | C |
|-----|--------|-------------------|--------|
| 1 | Season | Player | Yards |
| 87 | 2000 | Small, Torrance | 0 |
| 88 | 2000 | Smith, Akili | 1253 |
| 89 | 2000 | Smith, Lamar | 0 |
| 90 | 2000 | Stewart, Kordell | 1860 |
| 91 | 2000 | Stoerner, Clint | 53 |
| 92 | 2000 | Testaverde, Vinny | 3732 |
| 93 | 2000 | Thomas, Thurman | 0 |
| 94 | 2000 | Thompson, Kevin | 8 |
| 95 | 2000 | Van Pelt, Alex | 67 |
| 96 | 2000 | Walter, Ken | 0 |
| 97 | 2000 | Warner, Kurt | 3429 |
| 98 | 2000 | Williams, Ricky | 34 |
| 99 | 2000 | Wright, Anthony | 237 |
| 100 | 2000 | Wycheck, Frank | 53 |
| 101 | 2000 | Wynn, Spergon | 167 |
| 102 | 2000 | Zeier, Eric | 19 |
| 103 | 2000 | Grand Total | 110131 |
| 104 | 2001 | Banks, Tony | 2386 |
| 105 | 2001 | Batch, Charlie | 2392 |
| 106 | 2001 | Berger, Mitch | 0 |
| 107 | 2001 | Bettis, Jerome | 32 |
| 108 | 2001 | Blake, Jeff | 0 |
| 109 | 2001 | Bledsoe, Drew | 400 |
| 110 | 2001 | Booker, Marty | 34 |
| 111 | 2001 | Bouman, Todd | 795 |
| 112 | 2001 | Brady, Tom | 2843 |
| 113 | 2001 | Brees, Drew | 221 |
| 114 | 2001 | Brooks, Aaron | 3832 |
| 115 | 2001 | Brown, Travis | 201 |
| 116 | 2001 | Brunell, Mark | 3309 |
| 117 | 2001 | Carter, Quincy | 1072 |
| 118 | 2001 | Chandler, Chris | 2847 |
| 119 | 2001 | Collins, Kerry | 3764 |
| 120 | 2001 | Collins, Todd | 40 |
| 121 | 2001 | Couch, Tim | 3040 |
| 122 | 2001 | Craig, Demaryius | 24 |

SCENARIO #3 FILTERING OUT DUPLICATE HEADERS OR TOTALS

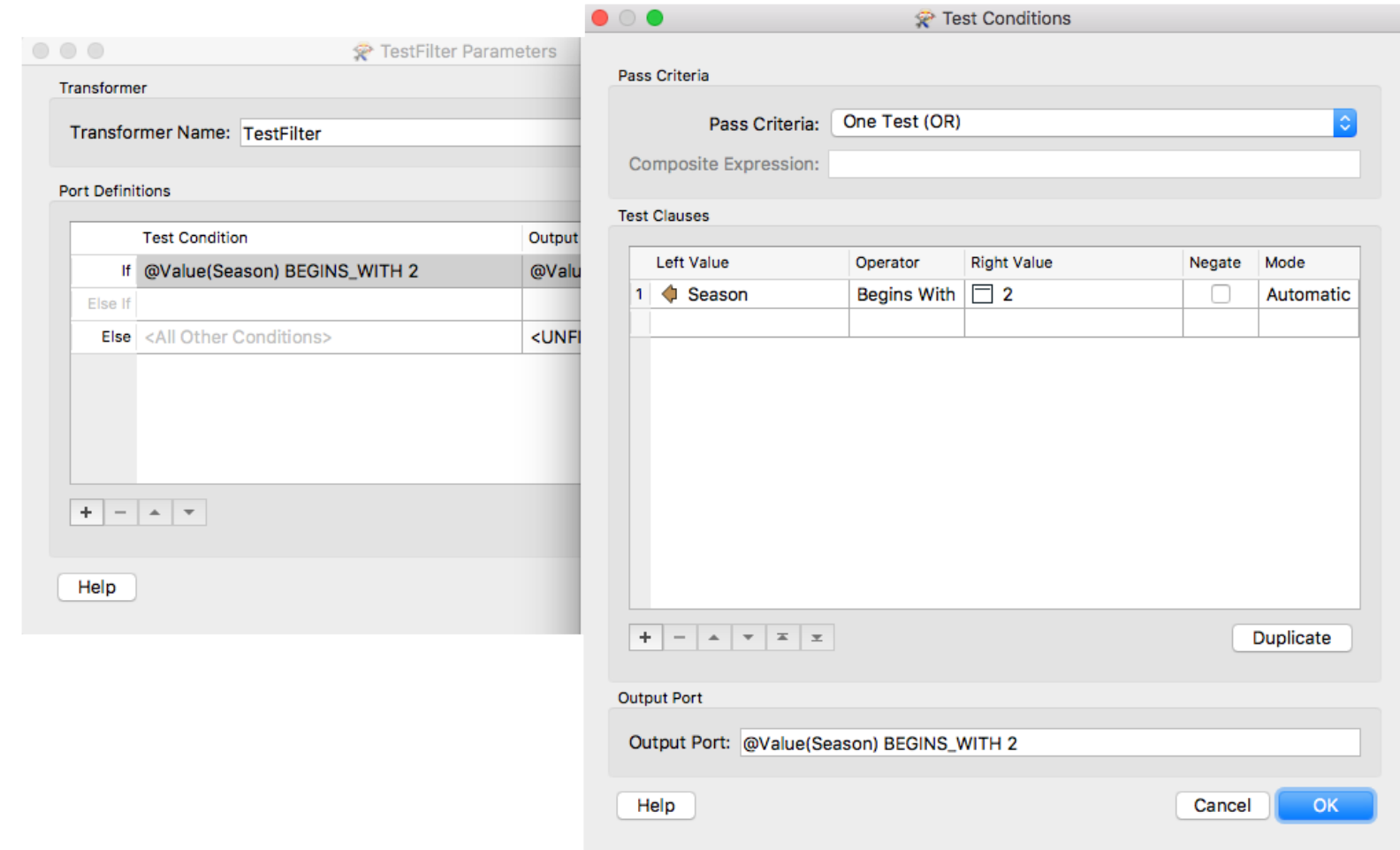
Business intelligence platforms don't work properly if the data has two rows of headers or contains rows for totals, so they should be removed. Going back to Scenario #1, the data isn't 100% ready for a business intelligence platform, as scrolling through the data coming out of the AttributeRenamer reveals that each appended worksheet has a row at the bottom for the grand totals.

Table: Passing Stats by Year - Prepared for BI [XLSXR] - 2005

| | Season | Player | Sum of Comp | Sum of Att |
|-----|--------|------------------|-------------|------------|
| 96 | 2000 | Warner, Kurt | 235 | 347 |
| 97 | 2000 | Williams, Ric... | 1 | 1 |
| 98 | 2000 | Wright, Anth... | 22 | 53 |
| 99 | 2000 | Wycheck, Fr... | 2 | 2 |
| 100 | 2000 | Wynn, Sperg... | 22 | 54 |
| 101 | 2000 | Zeier, Eric | 3 | 3 |
| 102 | 2000 | Grand Total | 9497 | 16322 |
| 103 | 2001 | Banks, Tony | 198 | 370 |
| 104 | 2001 | Batch, Charlie | 198 | 341 |
| 105 | 2001 | Berger, Mitch | 0 | 1 |
| 106 | 2001 | Bettis, Jerome | 1 | 2 |
| 107 | 2001 | Bla | | |
| 108 | 2001 | Ble | | |

Hint: to do this double click the little oval with a number in the connector line.

To eliminate these rows, use the TestFilter.



In the Test Conditions dialog, set the Test Clause to find rows where the value for Player equals "Grand Total". Check the Negate box to send these values to a rejected output port.

To filter out columns that contain totals, use the AttributeRemover.

Scenario #4 - Renaming Columns

Business intelligence platforms require that columns be unique and descriptive. There are scenarios where it is necessary to rename the columns of datasets. For example, when data is read from an HTML table, often the column names will be Col1, Col2, Col3 and so on.

Table View

Table: defense [HTMLTABLE] - Table1

| | Col1 | Col2 | Col3 | Col4 | Col5 | Col6 | Col7 | Col8 | Col9 | Col10 |
|----|------|------------|------|-------|------|---------|------|---------|------|-------|
| 1 | RK | TEAM | YDS | YDS/G | PASS | P YDS/G | RUSH | R YDS/G | PTS | PTS/G |
| 2 | 1 | Denver | 1309 | 261.8 | 958 | 191.6 | 351 | 70.2 | 97 | 19.4 |
| 3 | 2 | Cincinnati | 1314 | 262.8 | 798 | 159.6 | 516 | 103.2 | 83 | 16.6 |
| 4 | 3 | Atlanta | 1562 | 312.4 | 1052 | 210.4 | 510 | 102.0 | 109 | 21.8 |
| 5 | 4 | Miami | 1577 | 315.4 | 1175 | 235.0 | 402 | 80.4 | 84 | 16.8 |
| 6 | 5 | Washington | 1580 | 316.0 | 1140 | 228.0 | 440 | 112 | 22.6 | |
| 7 | 6 | Buffalo | 1612 | 322.4 | 1174 | 234.8 | 438 | | | |
| 8 | 7 | Pittsburgh | 1632 | 272.0 | 921 | 153.5 | 711 | | | |
| 9 | 8 | Seattle | 1650 | 330.0 | 1014 | 202.8 | 636 | | | |
| 10 | 9 | Carolina | 1680 | 280.0 | 1180 | 196.7 | 500 | | | |
| 11 | 10 | Dallas | 1699 | 339.8 | 1109 | 221.8 | 590 | | | |
| 12 | 11 | Minnesota | 1773 | 295.5 | 1301 | 216.8 | 472 | | | |
| 13 | 12 | Chicago | 1816 | 302.7 | 1190 | 198.3 | 626 | | | |

in any column

AttributeRenamer Parameters

Transformer

Transformer Name: AttributeRenamer_4

Attributes To Rename

| Input Attribute | Output Attribute | Default Value |
|-----------------|------------------|---------------|
| Col1 | Rank | |
| Col2 | Team | |
| | | |
| | | |

Filter: Import ...

Help Defaults Cancel OK

Use the AttributeRenamer to give columns unique and descriptive names for analysis with B.I. tools.

Conclusion: Use FME for Automated, Hands-Free Data Prep

Hopefully this guide helps you prepare datasets to fit the rigid model requirements of business intelligence platforms. Using these tips in FME Workbench you can design automated, hands-free workflows that save time and errors and help you get the insights you need from your data.



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