Working with Basic Data Transformations

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Overview

Work with the foreach and generate commands to project useful bits of data

Understand the different kinds of functions available in Pig e.g. evaluate and filter functions

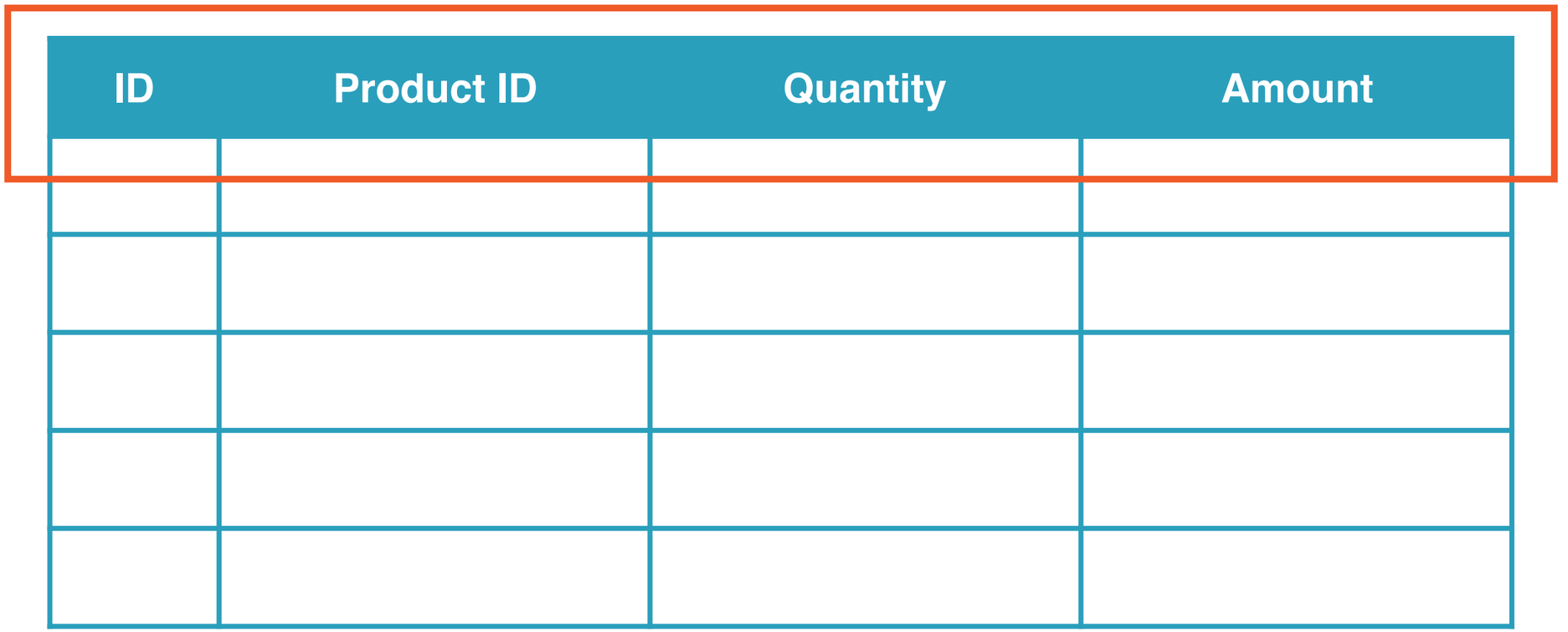
Work with basic transformation such as distinct, sort, limit and split

The Foreach and Generate Commands

Foreach... Generate...

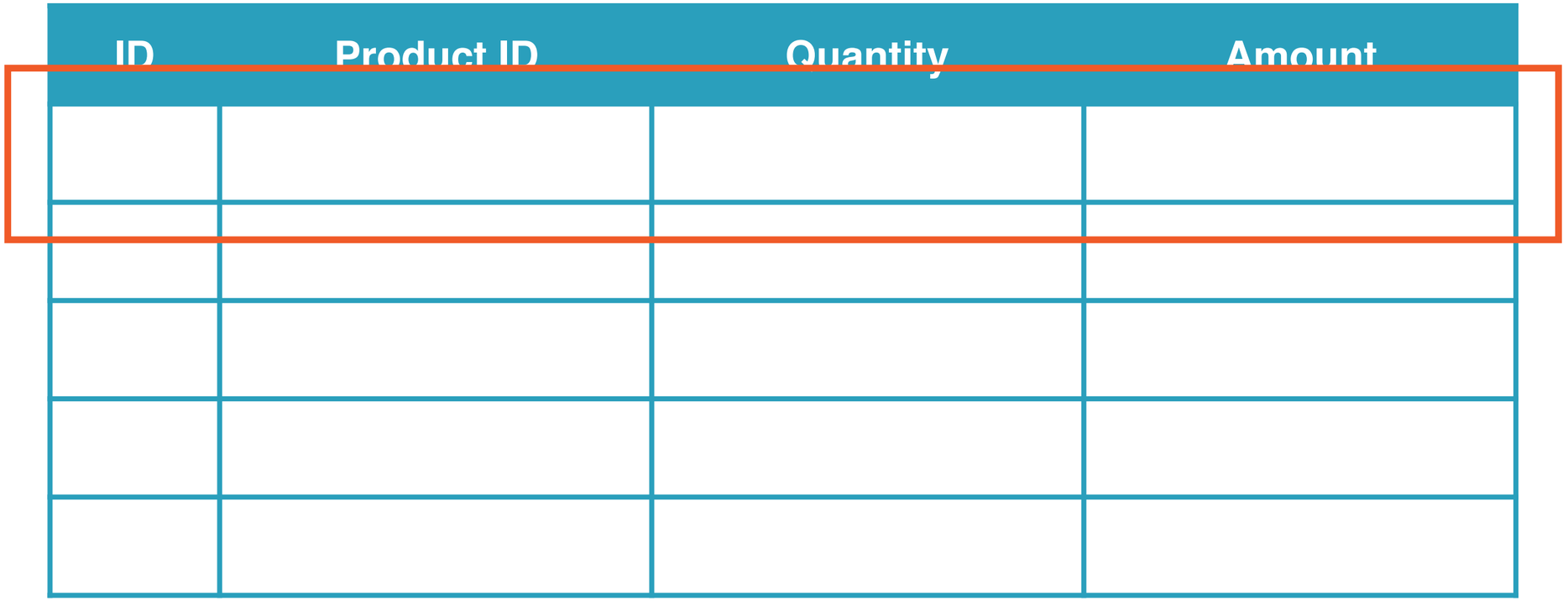
Relation

Foreach... Generate...



Field names

Foreach... Generate...



Tuple

Foreach... Generate...

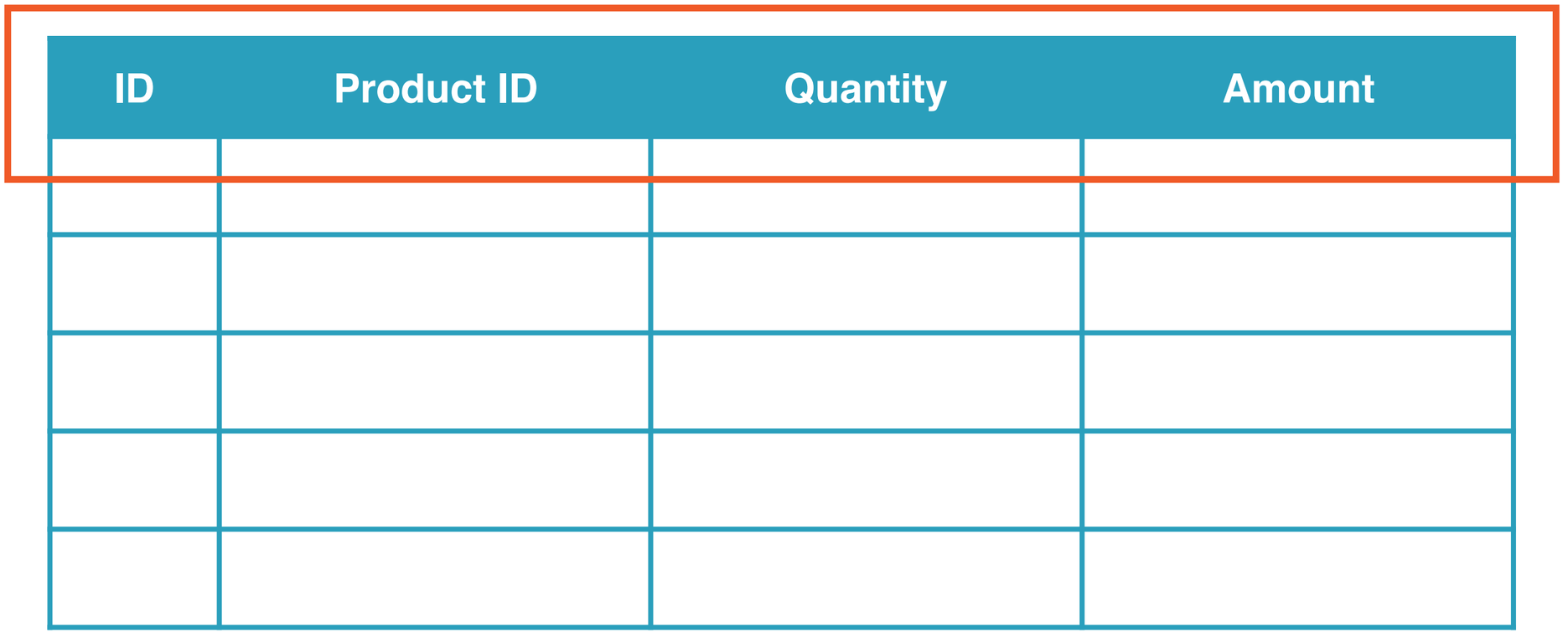
Foreach iterates through every tuple in a relation (or inner bag)

Foreach... Generate...

ID	Product ID	Quantity	Amount

And projects the fields that we're interested in

Foreach... Generate...



The projected fields can also be part of expressions

Demo

The foreach and generate statements:

- using column indexes

- using column names

Demo

The foreach and generate statements with complex data types such as:

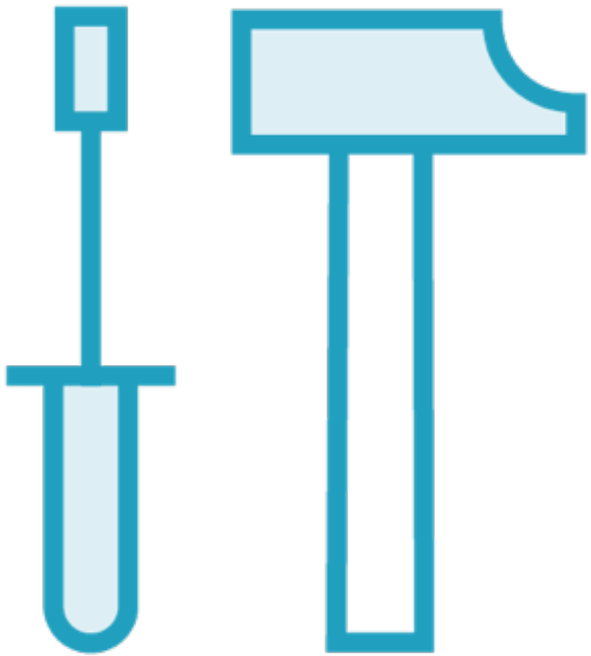
- tuple

- map

- bag

Applying Functions Using Foreach

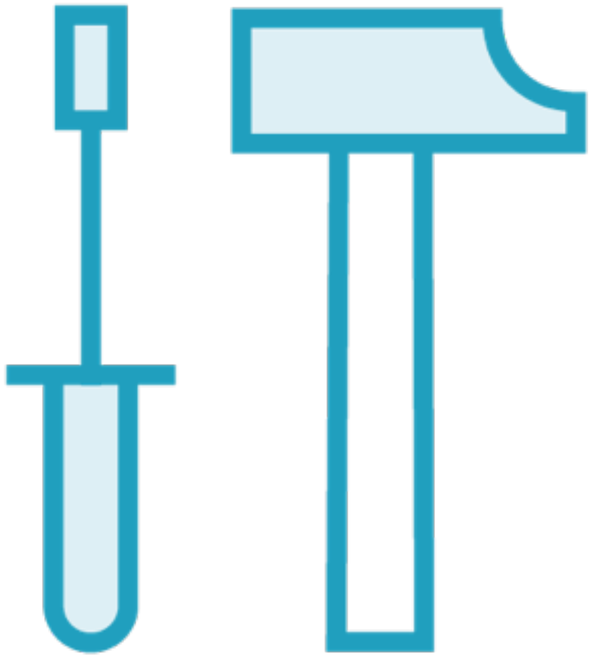
Functions in Pig



UDF - User Defined Functions

Pig allows developers to write their own custom functions which operates on data

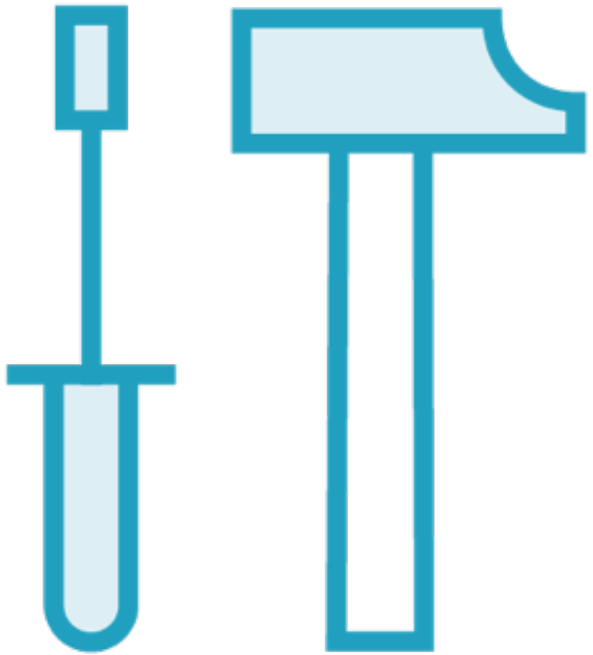
Functions in Pig



UDF - User Defined Functions

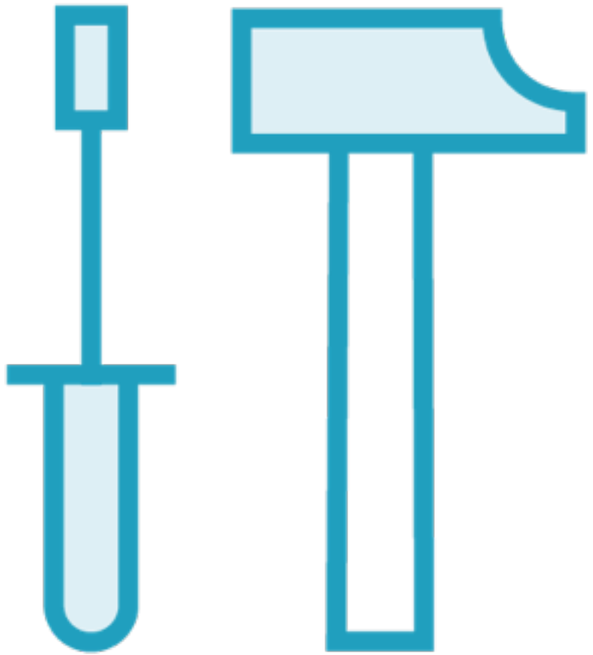
Pig supports UDFs in a number of programming languages such as Java, Python, Ruby, JavaScript

Built-in UDFs



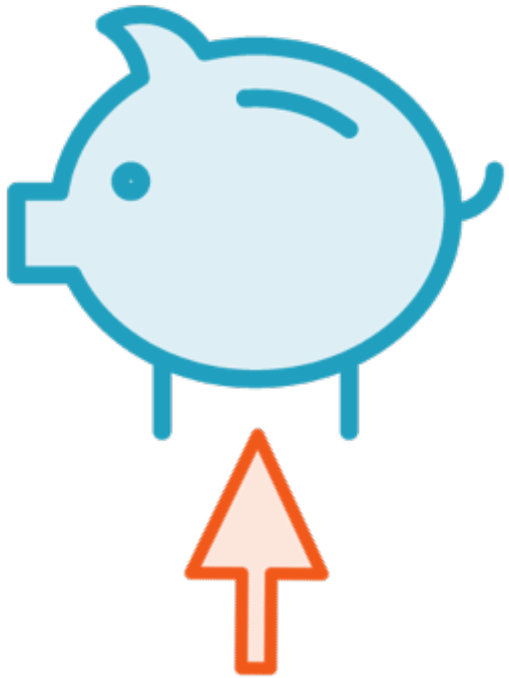
Pig comes prepackaged with a number of UDFs that can be directly used

Built-in UDFs

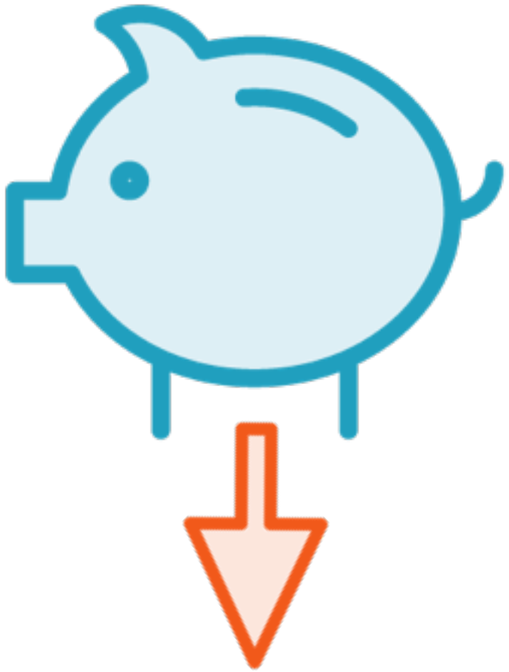


These make Pig very powerful right out of the box

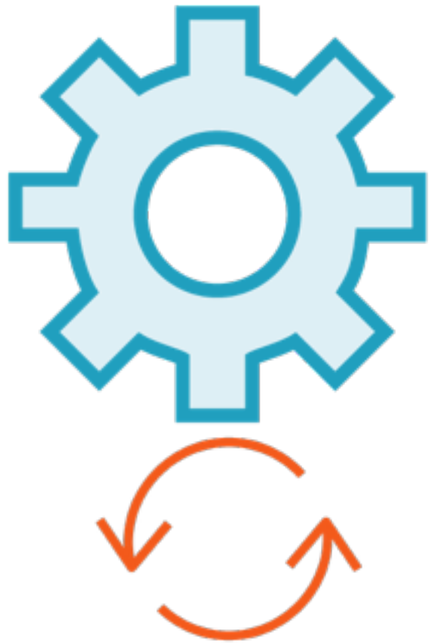
Built-in UDFs



Load



Store



Evaluate

Filter

Load and Store

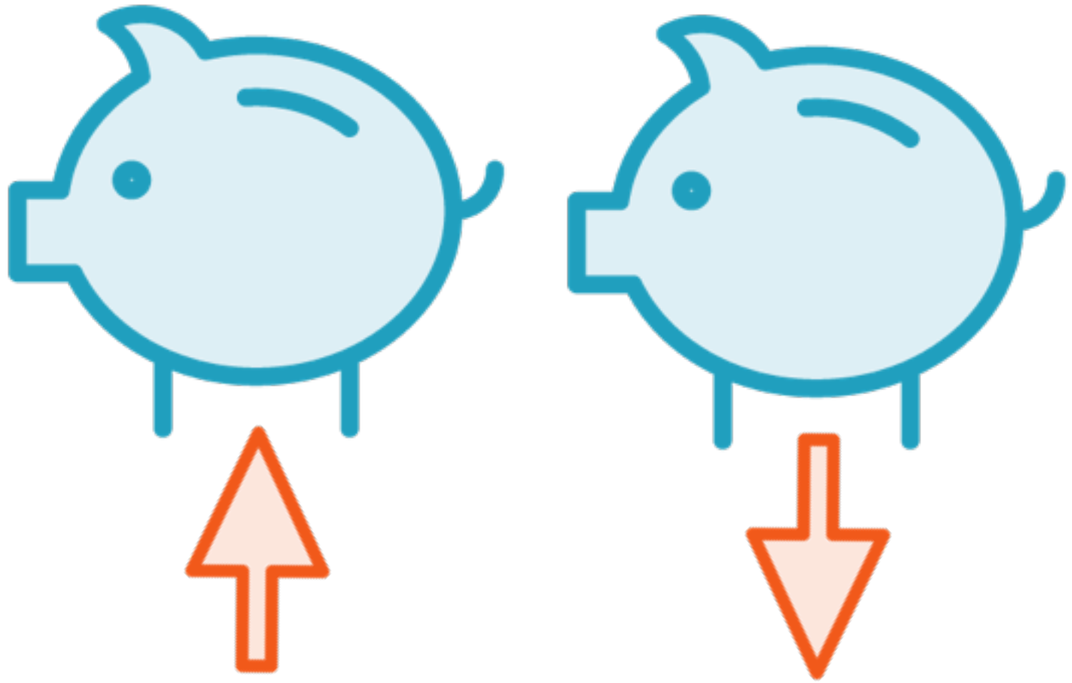
PigStorage()

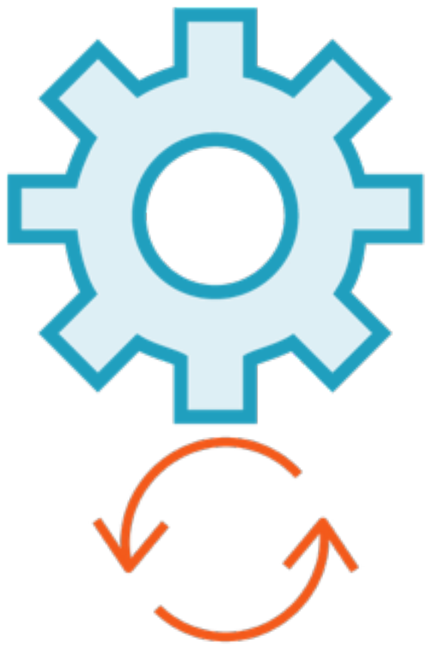
HBaseStorage()

JsonLoader()

AvroStorage()

CSVExcelStorage()





Evaluate Functions

Math: Works with numeric data types

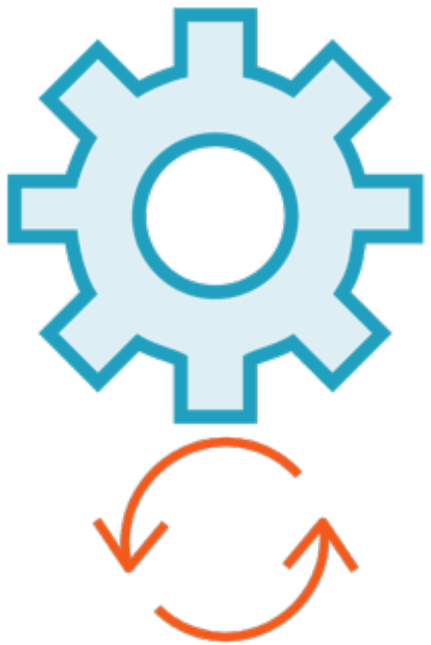
String: Works with the chararray

Date: Works with datetime

Complex data types: Used with the tuple, bag and map type

Aggregate: Different functions take different kinds of input

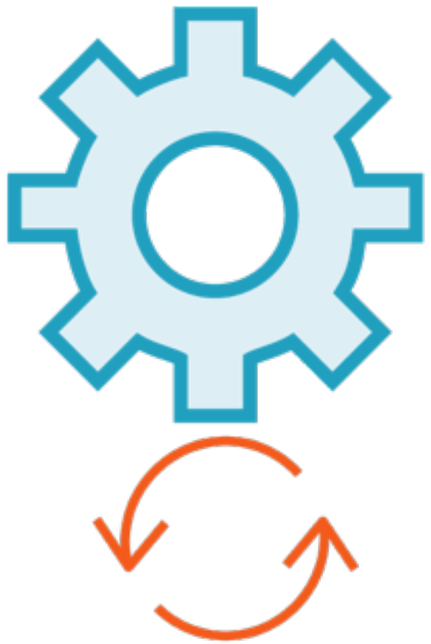
Complex Data Types



TOTUPLE(), TOBAG(), TOMAP()

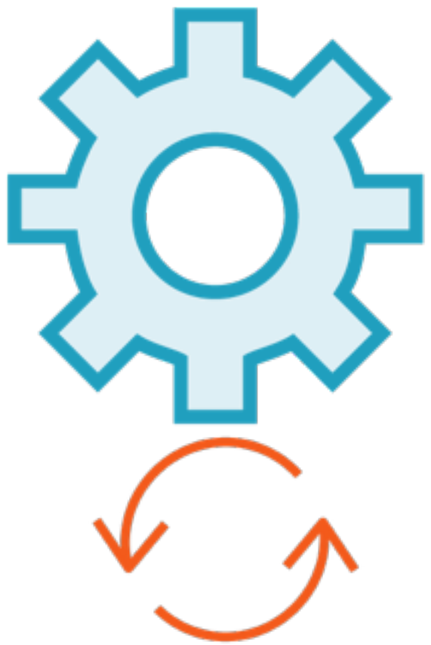
Familiar with these

Aggregate



SUM(), COUNT() etc

Will cover these once we've understood how group by works



Evaluate Functions

Math: Works with numeric data types

String: Works with the chararray

Date: Works with datetime

Complex data types: Used with the tuple, bag and map type

Aggregate: Different functions take different kinds of input

Demo

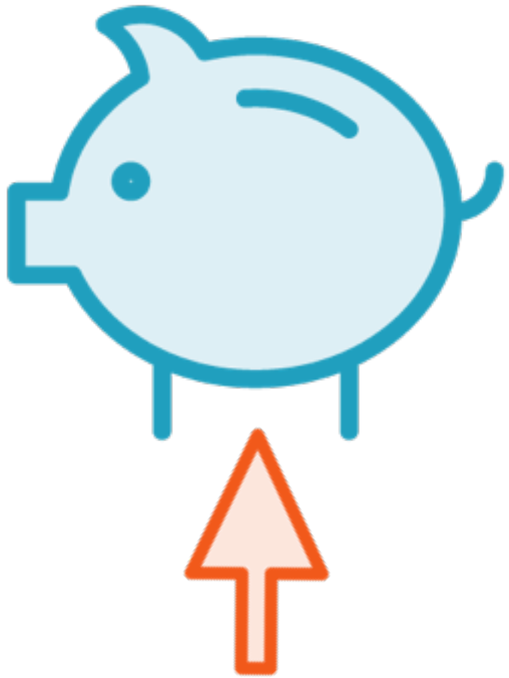
Use function to evaluate fields:

- math functions

- string functions

- date functions

Built-in UDFs



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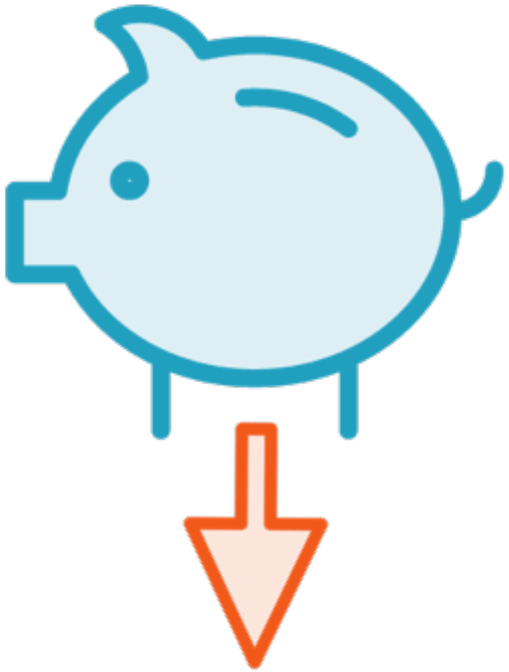
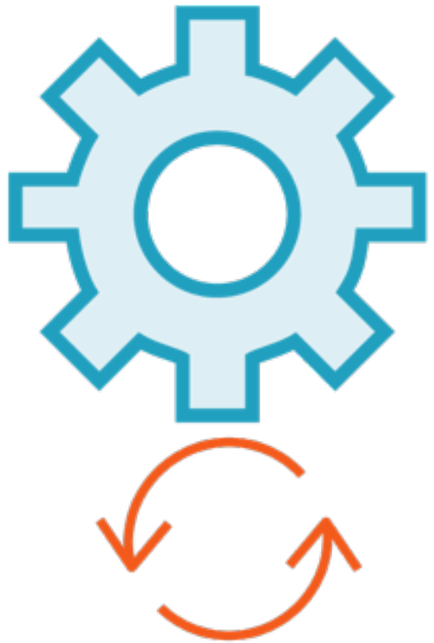


Store



Evaluate

Filter

Filter

A condition determines which record is in the result dataset

- Condition = true: Include record
- Condition = false: Leave record out

Equivalent of the where clause in SQL

Conditional Operators for Filters

==, >, <,

!=, >=, <=

Filter functions

Conditional Operators for Filters

==, >, <,

!=, >=, <=

All work with scalar data types

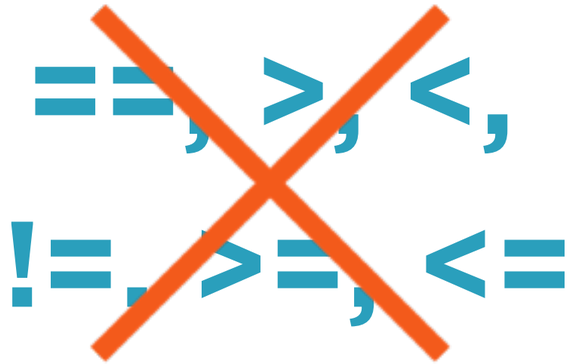
Conditional Operators for Filters

==, >, <,

!=, >=, <=

Apply to maps and tuples

Conditional Operators for Filters



None work with bags

Filter functions

UDFs meant to be used with the filter command

Filter Functions

matches

IsEmpty

Filter Functions

matches

```
order_id matches ‘OD01’

order_id matches ‘OD01.*’
```

Filter Functions

IsEmpty

Used to check whether a bag or map is empty

They cannot be null

Demo

Use the filter keyword to filter records by predicate using:

- conditional operators

- the matches filter function

The Distinct, Limit and Sort Commands

Distinct, Limit and Sort

Distinct

Remove duplicate tuples from a relation

Limit

Choose a specified number of tuples from a relation

Order By

Sort tuples in ascending or descending order based on a column value

Distinct

Distinct

Remove duplicate tuples from a relation

Acts on entire records in a relation

- tuples where all fields have the same value are duplicates

Does not act on individual fields

Limit

Limit

Choose a specified number of tuples from a relation

Specify N, the number of records we're interested in

Limit chooses the first N records

Order By

Order By

Sort tuples in ascending or descending order based on a column value

Sorting is done based on a particular column

Ascending as well as descending order

Default is ascending order

Demo

Implement commands in Pig using the following keywords

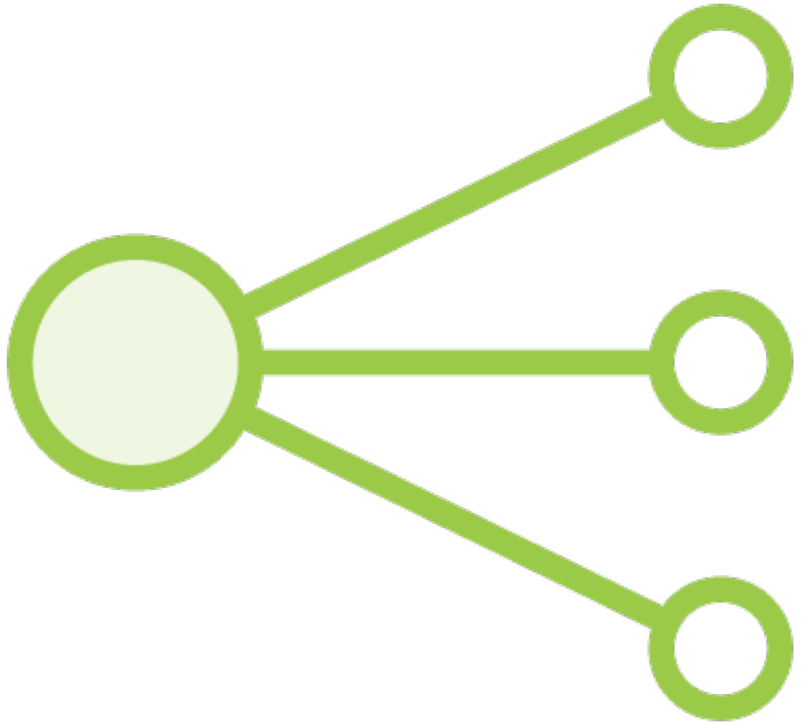
- distinct

- limit

- order by

The Split Command

Split

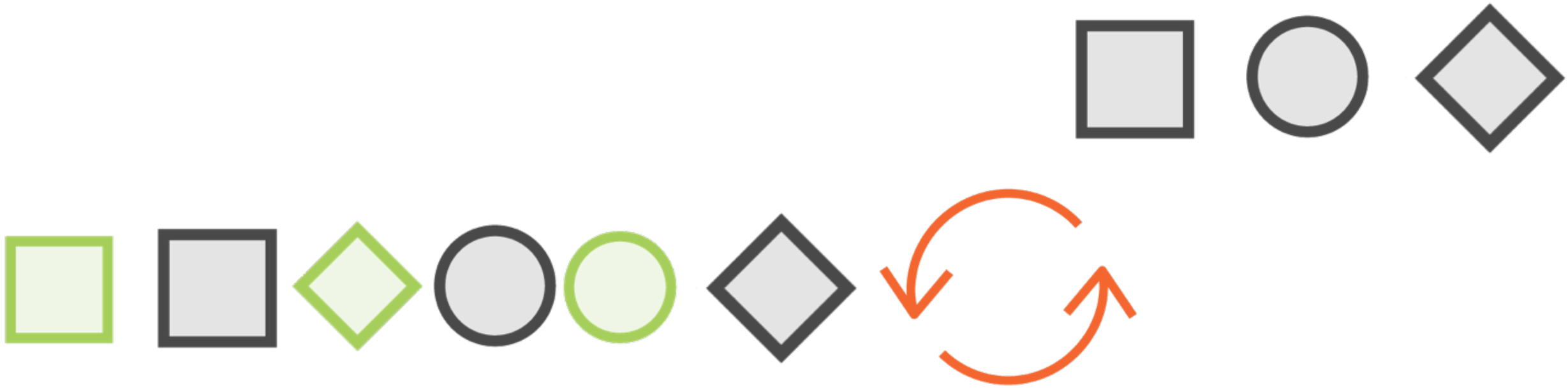


Split

Explicitly split data into two or more data flows based on conditions

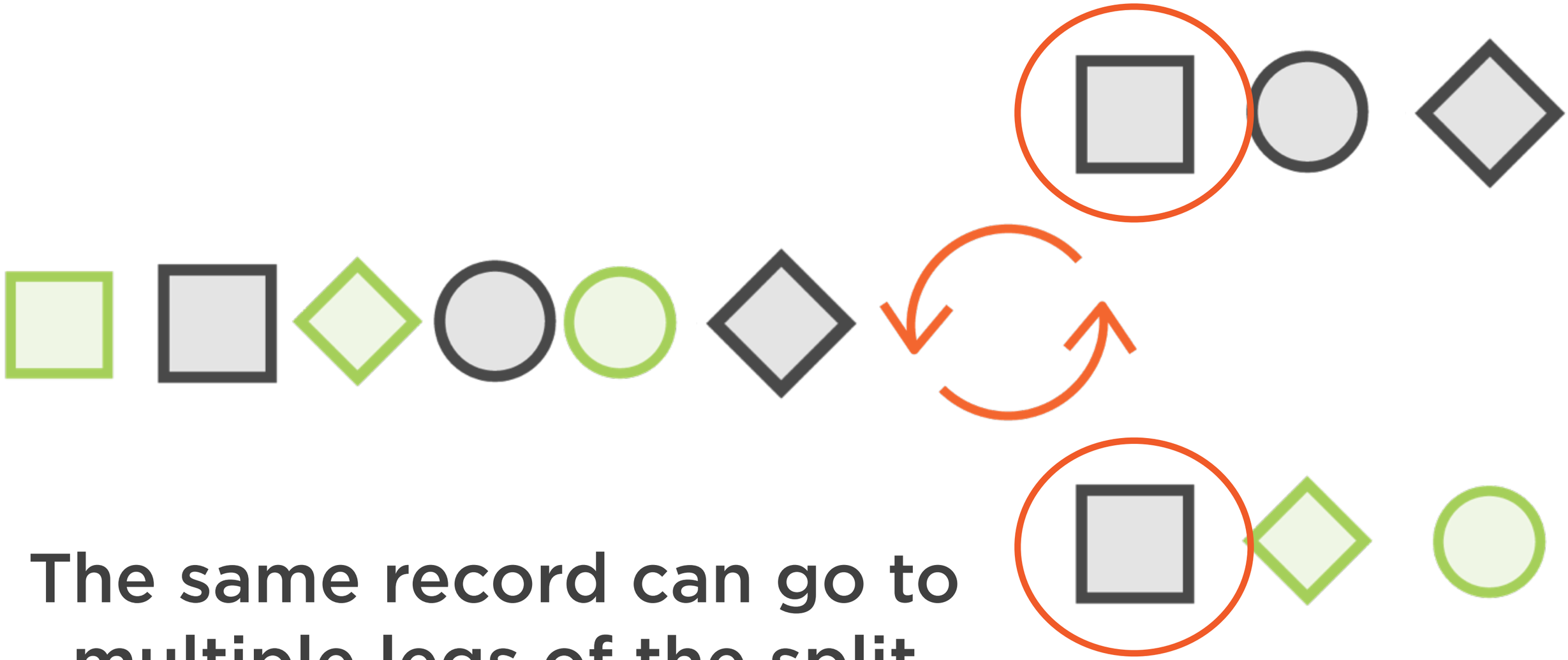
Split

Split



2 or more data flows
can be created

Split



The same record can go to multiple legs of the split

Demo

Use the split command to separate records into multiple logical relations

Summary

Implemented the foreach-generate commands to project useful information from relations

Understood and worked with different types of Pig functions such as evaluate and filter.

Implemented basic transformations such as distinct, sort, limit and split