PIG

High Level Data Flow Language

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Agenda

- Map-Reduce and the need for Pig Latin
- Pig Latin
- Compilation into Map-Reduce
- Implementation
- Comparison with Map-Reduce
- Optimization in Pig

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The Map-Reduce Appeal

Scale

Scalable due to simpler design

- Only parallelizable operations
- No transactions

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Runs on cheap commodity hardware

~~SQL~~

Procedural Control- a processing “pipe”

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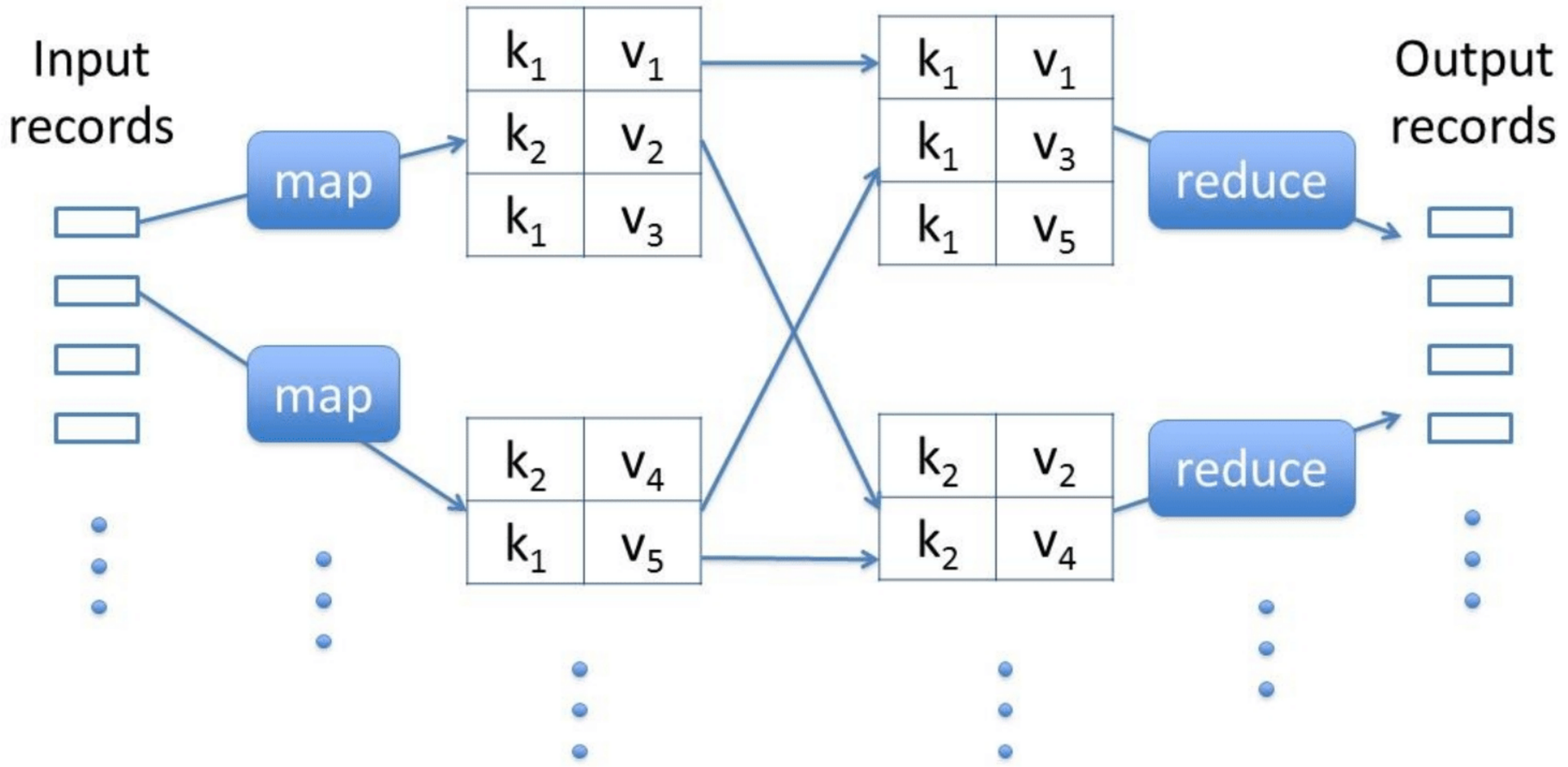
Map-Reduce



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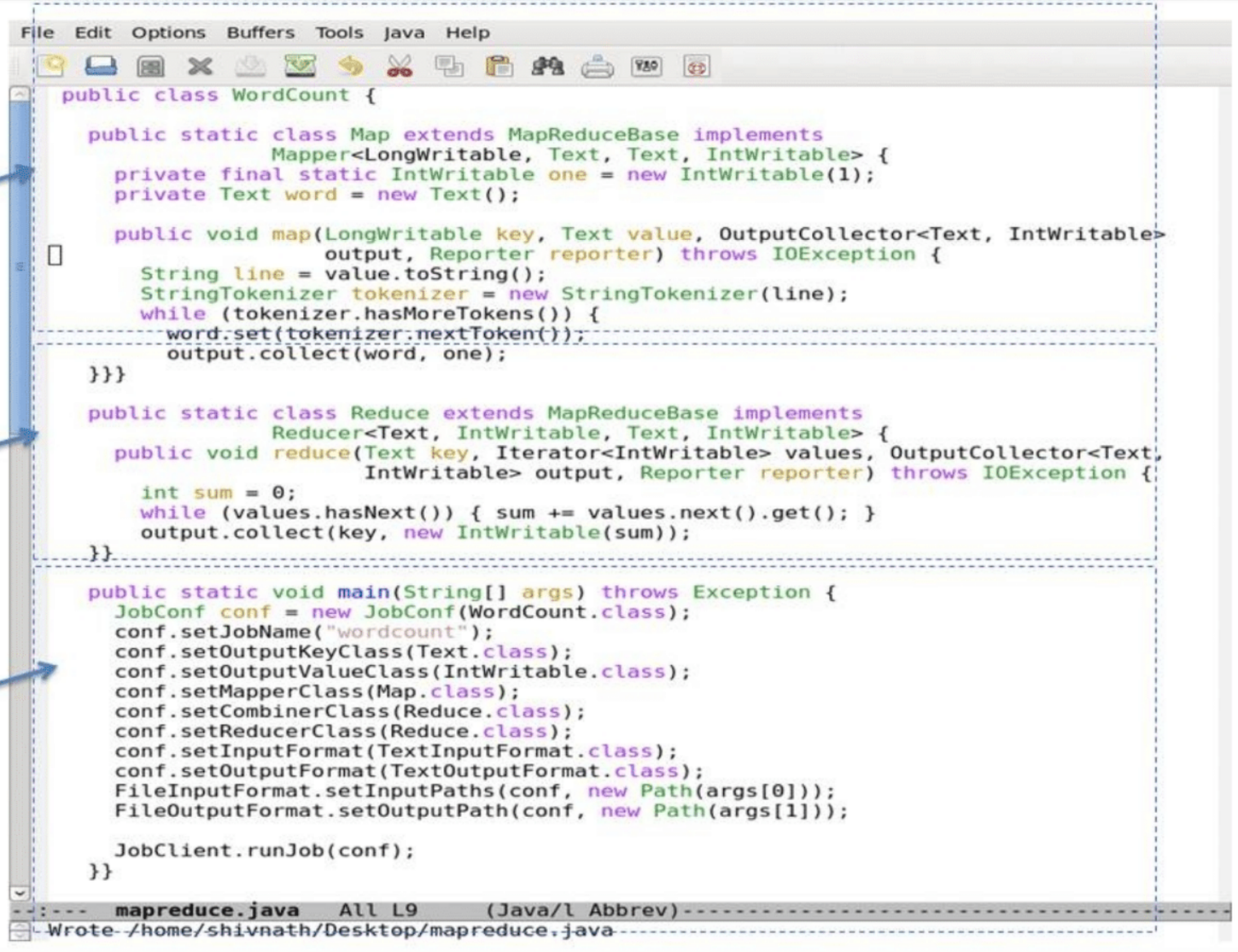
Java Example

map

reduce

Job conf.



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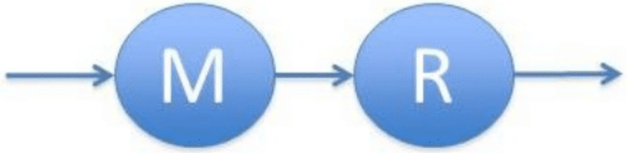
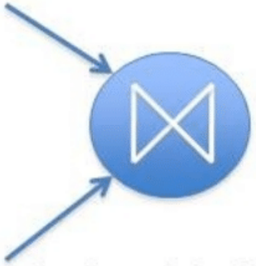
Disadvantages

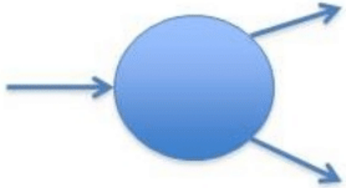
1. Extremely rigid data flow



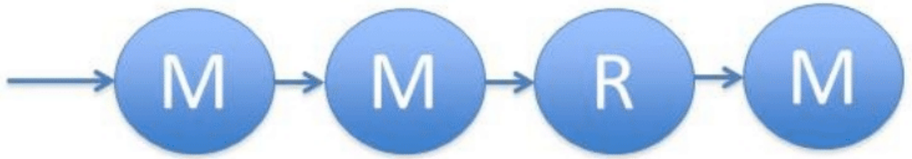
Other flows constantly hacked in



Join, Union



Split



Chains

2. Common operations must be coded by hand
   - Join, filter, projection, aggregates, sorting, distinct

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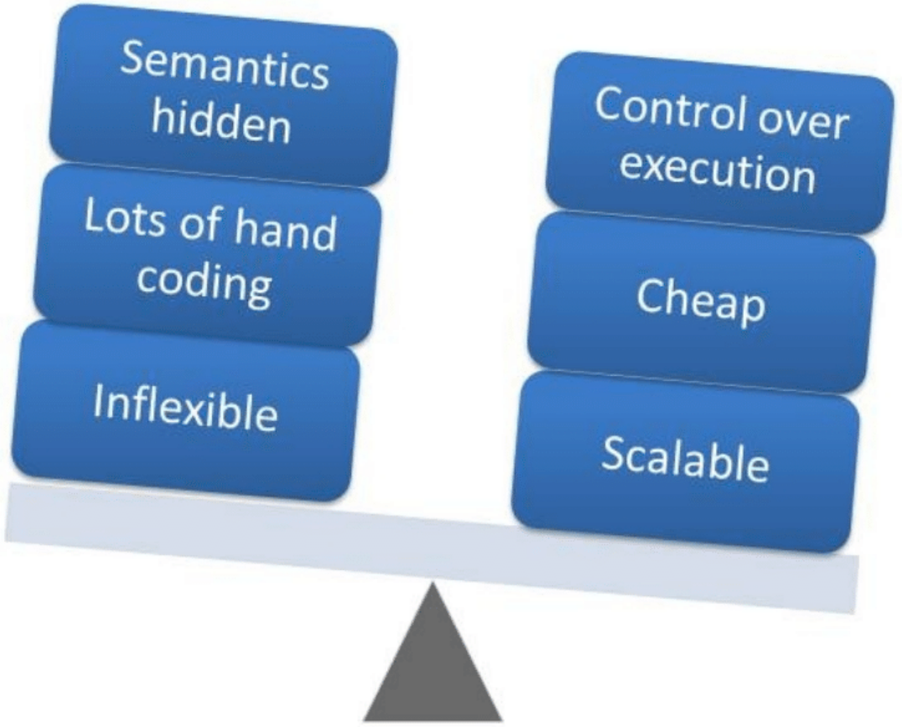
Pros And Cons

Need a high-level, general data flow language



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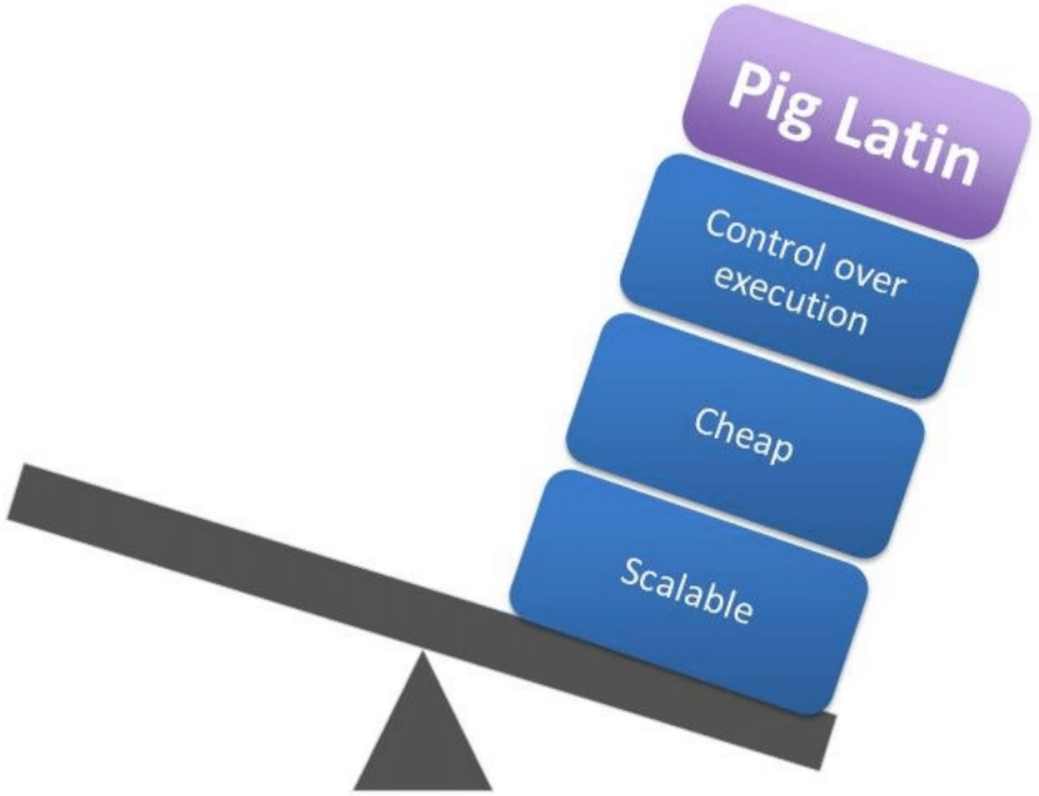
Enter Pig Latin

Need a high-level, general data flow language



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What is Pig

- A platform for analyzing large data sets that consists of a high-level language for expressing data analysis programs.
- Compiles down to Map Reduce jobs
- Developed by Yahoo!
- Open-source language

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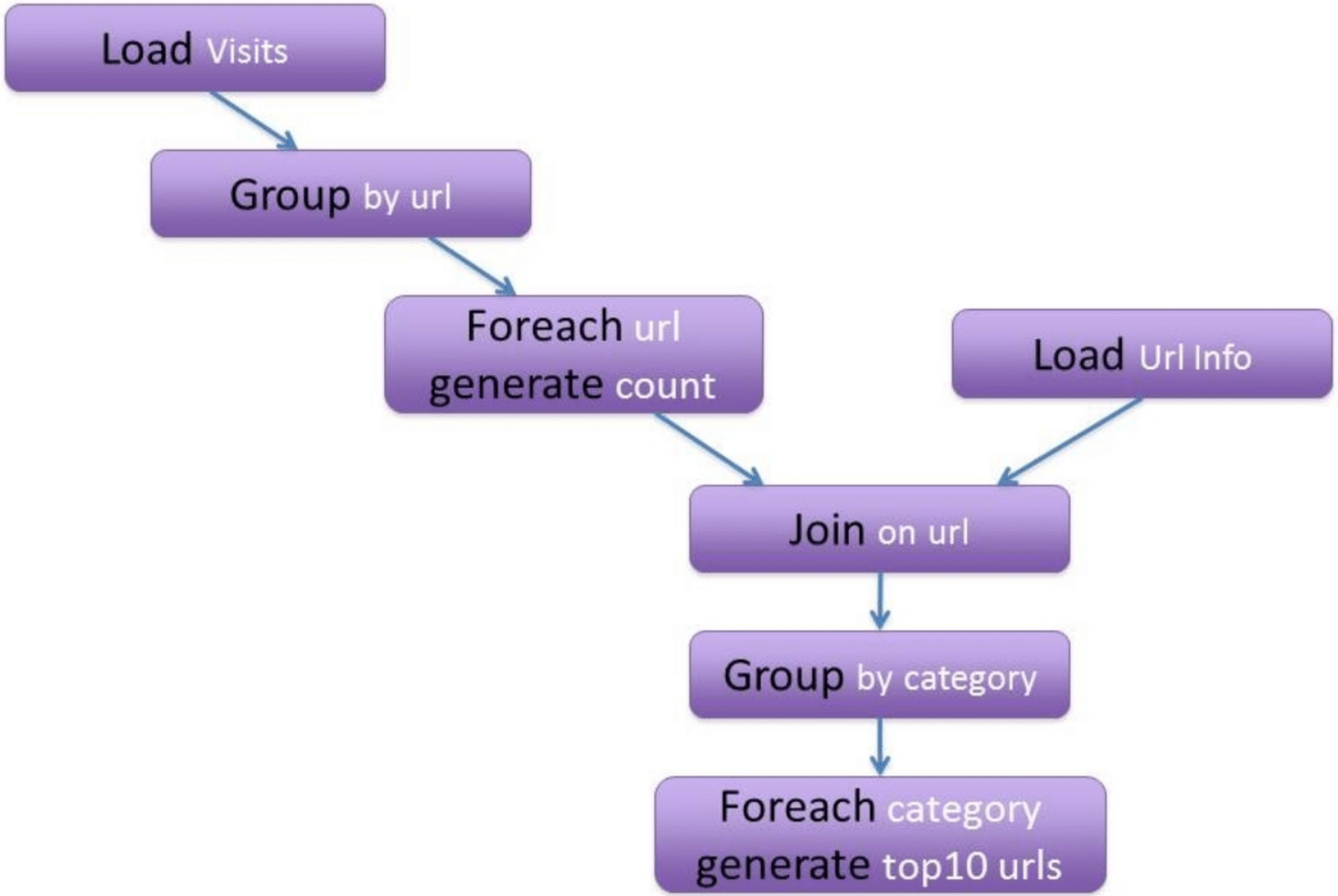
Data Flow



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In Pig Latin

```
visits       = load '/data/visits' as (user, url, time);
gVisits      = group visits by url;
visitCounts  = foreach gVisits generate url, count(visits);

urlInfo      = load '/data/urlInfo' as (url, category, pRank);
visitCounts  = join visitCounts by url, urlInfo by url;

gCategories = group visitCounts by category;
topUrls = foreach gCategories generate top(visitCounts,10);

store topUrls into '/data/topUrls';
```

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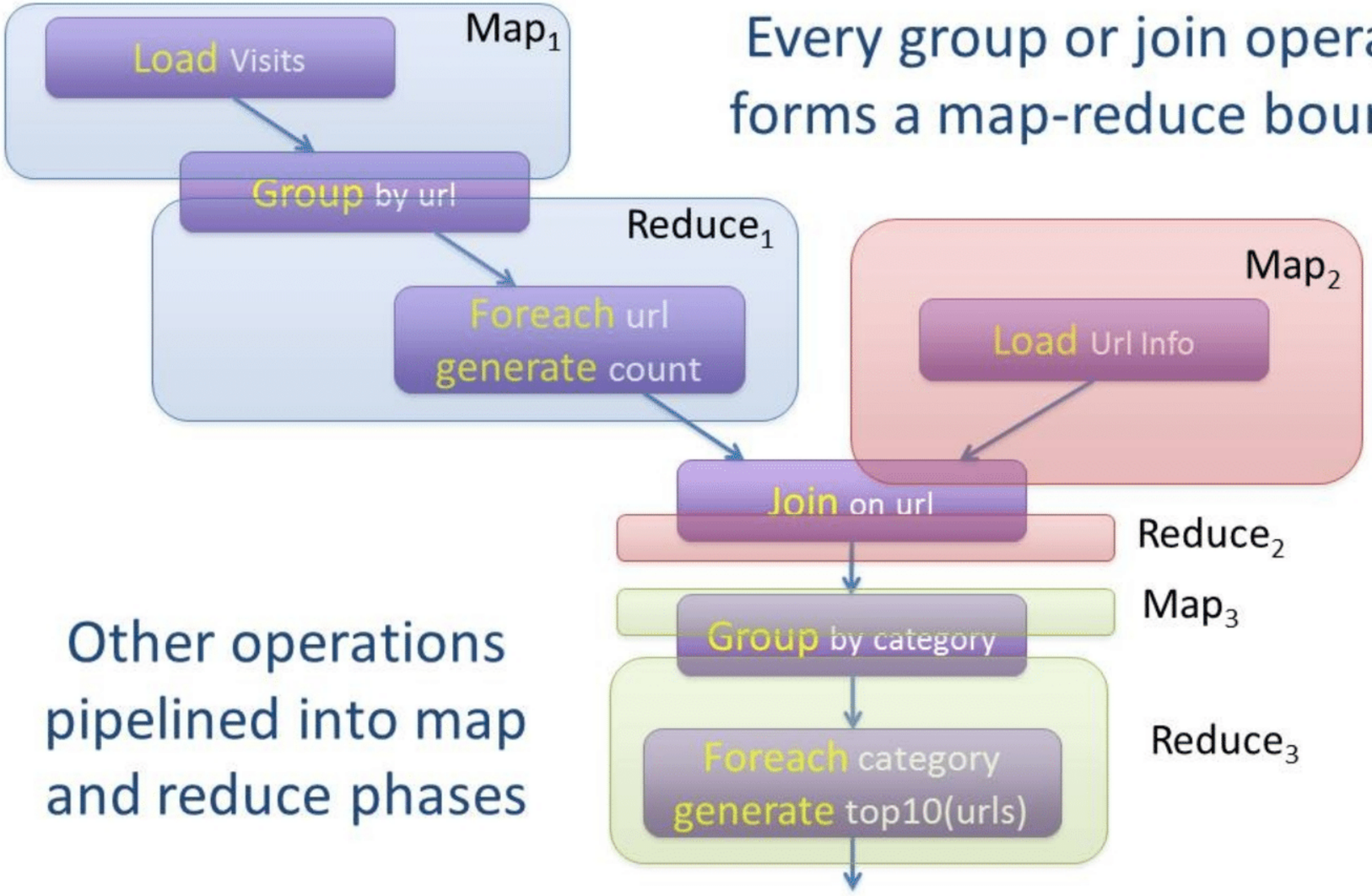
Contd..



Every group or join operation forms a map-reduce boundary

Other operations pipelined into map and reduce phases

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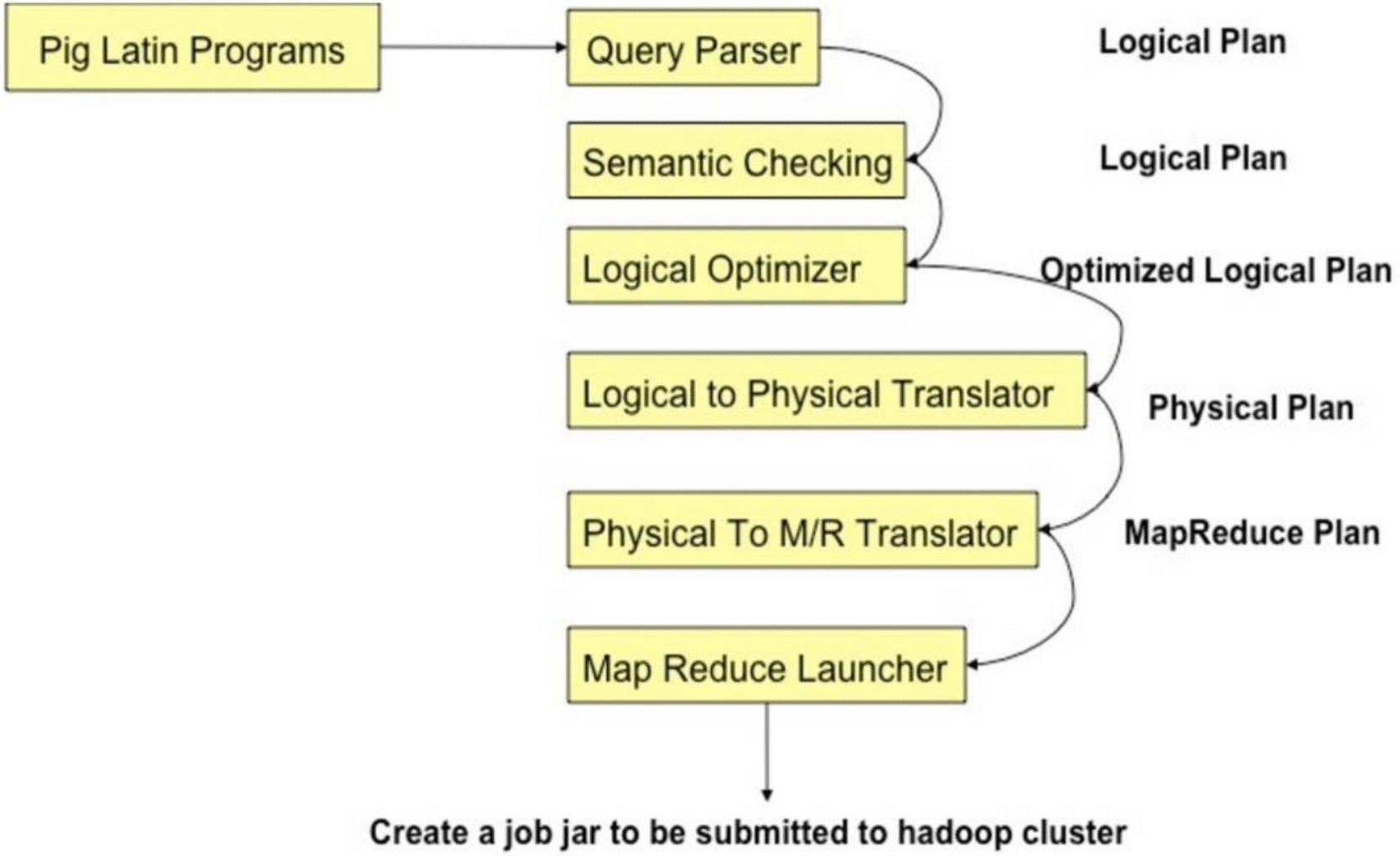
Pig Compilation



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Implementation