KNIME and the Web – Extract, Test, Automate

KNIME Spring Summit,
Berlin, 25.02.2016

Philipp Katz,

Our Background

- Three former PhD students at TU Dresden (me, Klemens Muthmann, David Urbansky)
- Computer Science, Information Extraction
- After PhD, each of us founded a startup

SEMKNOX
Smart Semantic Product Search

LINEUPR

CYFACE
(fancy logo under construction)

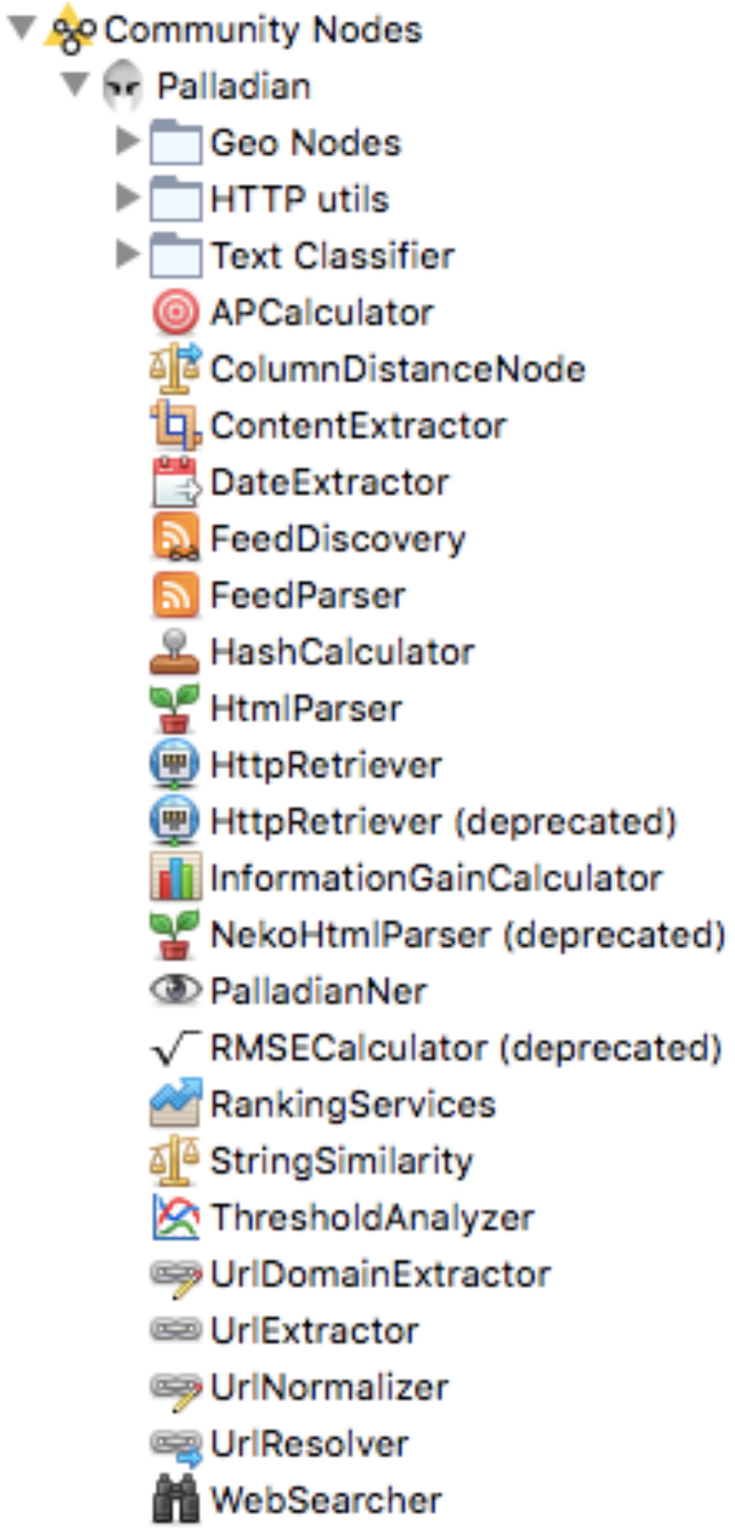
Palladian Nodes

Palladian?

- Java-based toolkit for information retrieval started in 2009
- Palladian KNIME nodes since 2011
- Used in commercial and academic projects
- Available from KNIME Community Contributions download site

The Palladian Nodes

- Text classification
- Content extraction
- Date extraction
- Named entity recognition
- Geo data extraction
- Web page, image, news search
- HTML, RSS, Atom parsing
- Ranking value retrieval
- Evaluation metrics



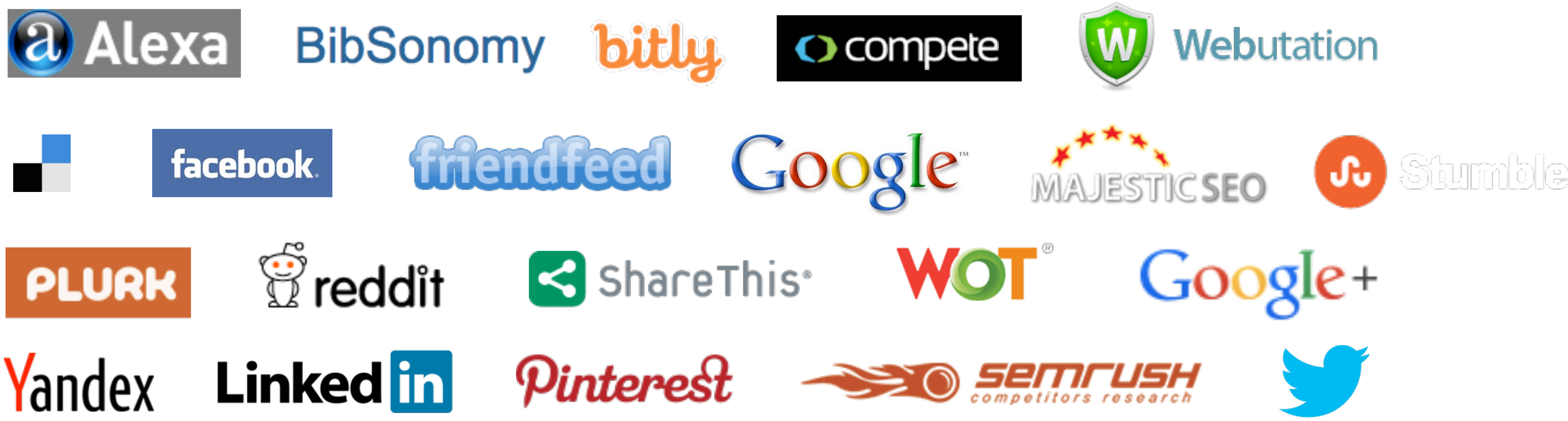
- ▼ Community Nodes
  - ▼ Palladian
    - ▶ Geo Nodes
    - ▶ HTTP utils
    - ▶ Text Classifier
    - APCalculator
    - ColumnDistanceNode
    - ContentExtractor
    - DateExtractor
    - FeedDiscovery
    - FeedParser
    - HashCalculator
    - HtmlParser
    - HttpRetriever
    - HttpRetriever (deprecated)
    - InformationGainCalculator
    - NekoHtmlParser (deprecated)
    - PalladianNer
    - RMSECalculator (deprecated)
    - RankingServices
    - StringSimilarity
    - ThresholdAnalyzer
    - UrlDomainExtractor
    - UrlExtractor
    - UrlNormalizer
    - UrlResolver
    - WebSearcher

Access Web APIs

- Web Searcher

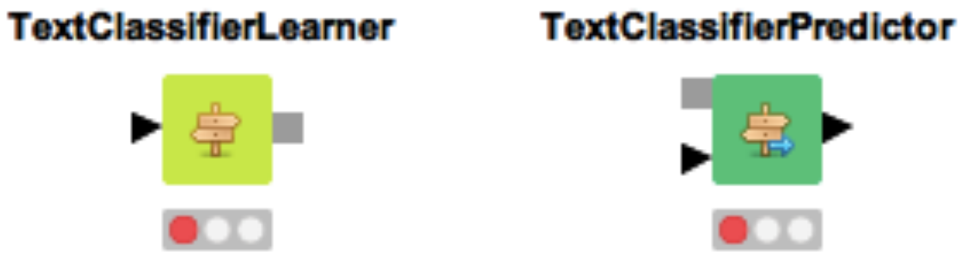
Google
bing
facebook
DuckDuckGo
vimeo
YouTube
Yandex
flickr from YAHOO!

- Ranking Services



Text Classification

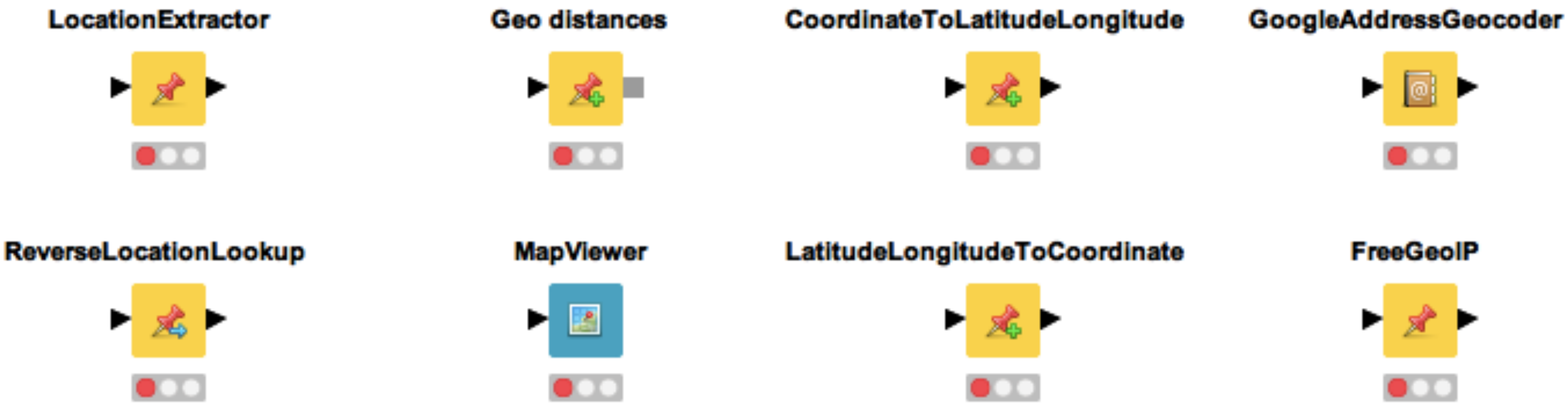
- Very simple, one predictor, one learner



- *n*-gram features and Naïve Bayes scoring
- Optimized for big amounts of training data
- Learner is now *streamable*, Predictor soon
- Competitive accuracy for many use cases

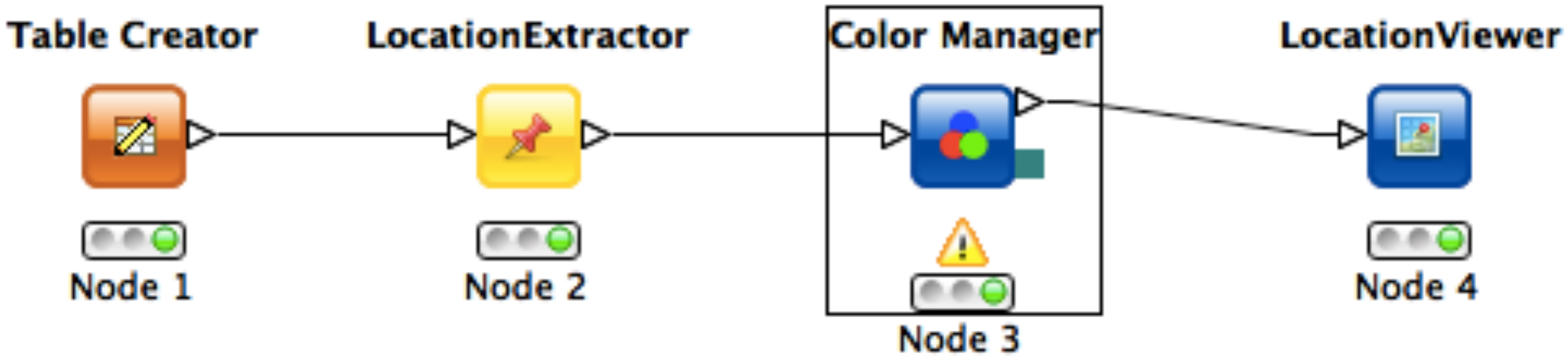
Geographic Data

- Was cooking for a while, added after last year's summit due to popular demand
- **New:** Nodes for IP and address lookup
- **New:** Use local gazetteer as source for location extraction node



Geographic Data

- Extract and disambiguate locations from unstructured text, visualize them on the map



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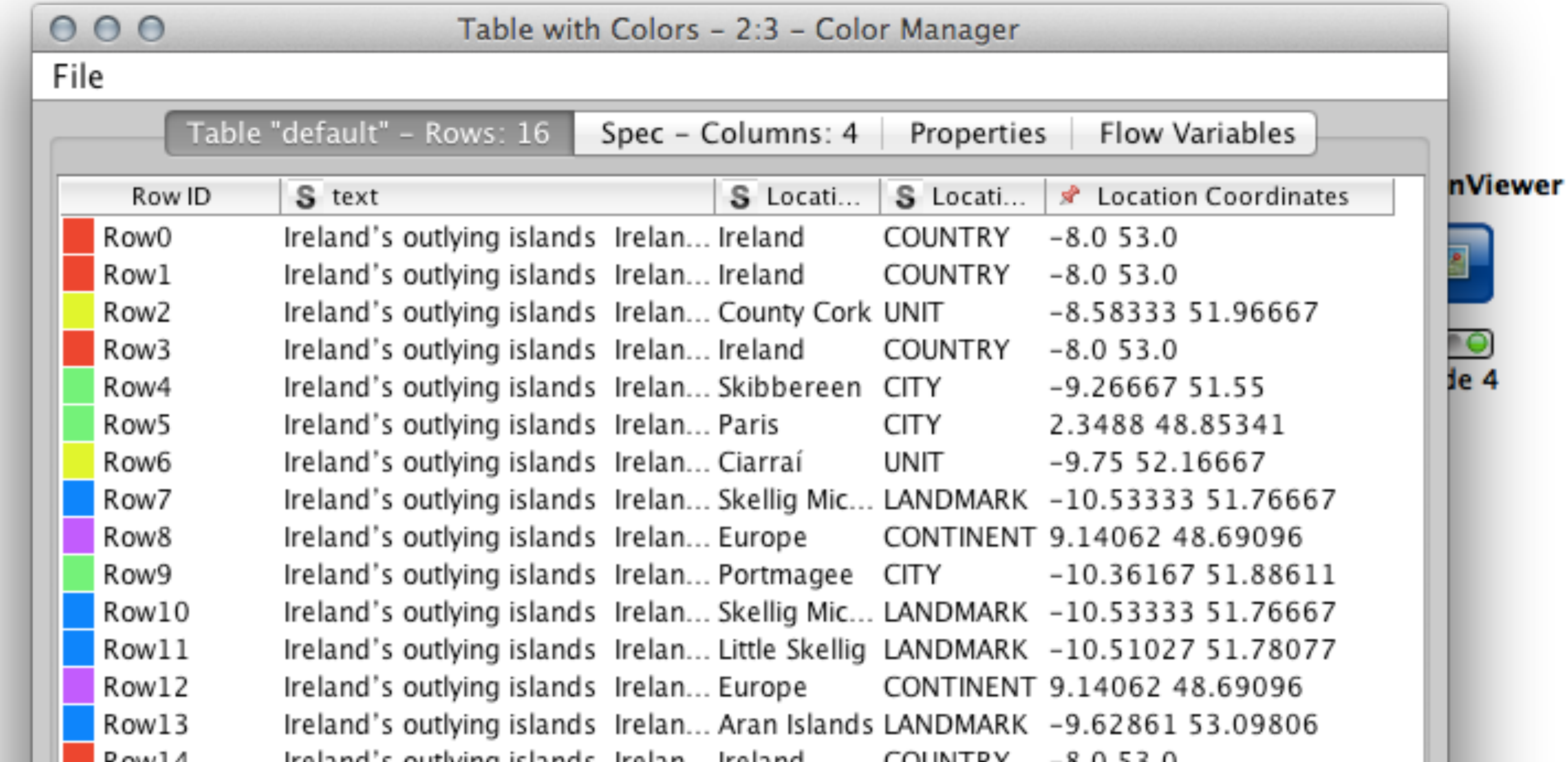
Table with Colors - 2:3 - Color Manager
File
Table "default" - Rows: 16
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Properties
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Row ID	S text	S Locati...	S Locati...	Location Coordinates
🟥 Row0	Ireland's outlying islands Irelan...	Ireland	COUNTRY	-8.0 53.0
🟥 Row1	Ireland's outlying islands Irelan...	Ireland	COUNTRY	-8.0 53.0
🟨 Row2	Ireland's outlying islands Irelan...	County Cork	UNIT	-8.58333 51.96667
🟥 Row3	Ireland's outlying islands Irelan...	Ireland	COUNTRY	-8.0 53.0
🟩 Row4	Ireland's outlying islands Irelan...	Skibbereen	CITY	-9.26667 51.55
🟩 Row5	Ireland's outlying islands Irelan...	Paris	CITY	2.3488 48.85341
🟨 Row6	Ireland's outlying islands Irelan...	Ciarraí	UNIT	-9.75 52.16667
🟦 Row7	Ireland's outlying islands Irelan...	Skellig Mic...	LANDMARK	-10.53333 51.76667
🟪 Row8	Ireland's outlying islands Irelan...	Europe	CONTINENT	9.14062 48.69096
🟩 Row9	Ireland's outlying islands Irelan...	Portmagee	CITY	-10.36167 51.88611
🟦 Row10	Ireland's outlying islands Irelan...	Skellig Mic...	LANDMARK	-10.53333 51.76667
🟦 Row11	Ireland's outlying islands Irelan...	Little Skellig	LANDMARK	-10.51027 51.78077
🟪 Row12	Ireland's outlying islands Irelan...	Europe	CONTINENT	9.14062 48.69096
🟦 Row13	Ireland's outlying islands Irelan...	Aran Islands	LANDMARK	-9.62861 53.09806
🟥 Row14	Ireland's outlying islands Irelan...	Ireland	COUNTRY	-8.0 53.0

Geographic Data

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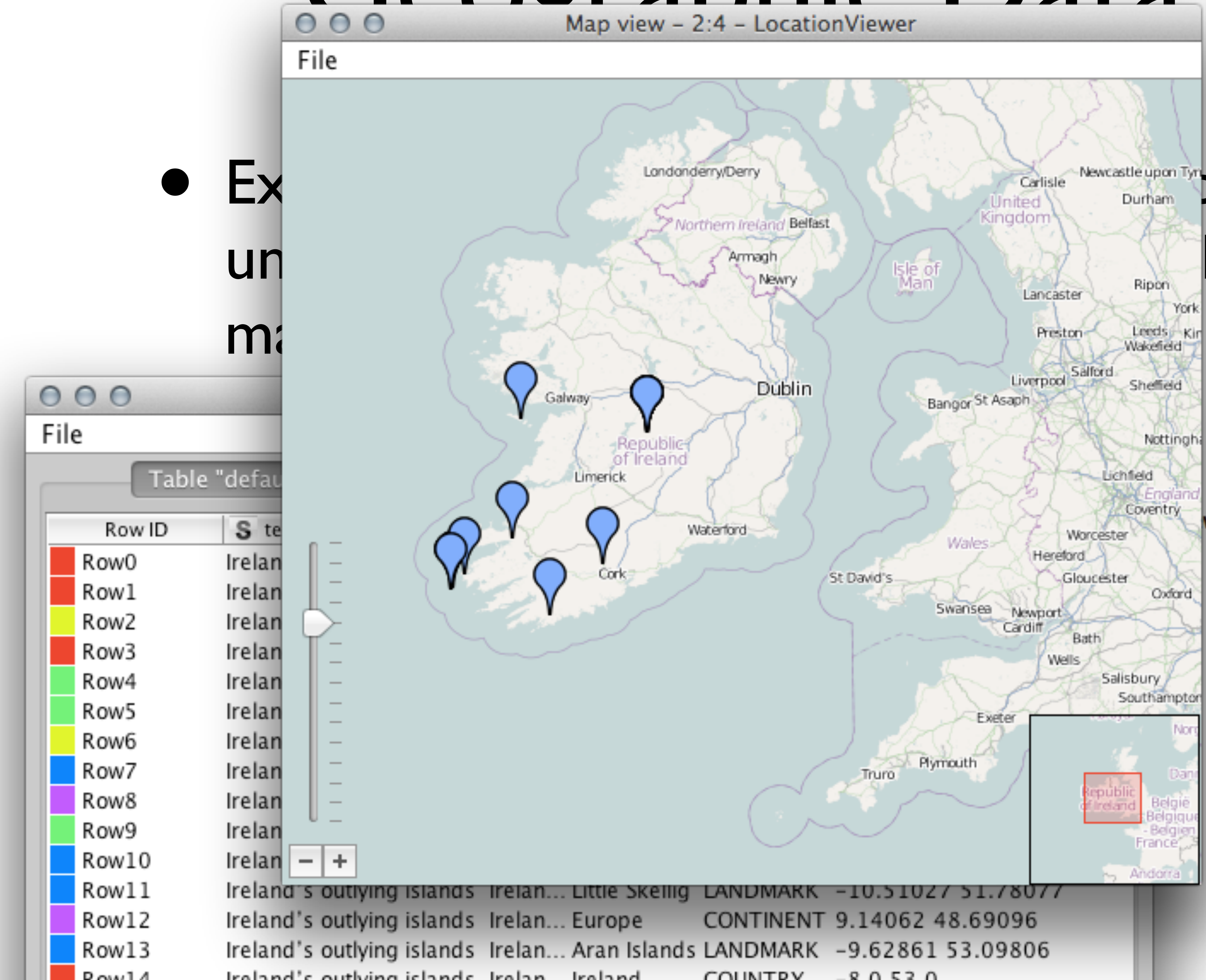

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🟦	Row10	Irelan					
🟦	Row11	Ireland's outlying islands	Irelan...	Little Skellig	LANDMARK	-10.51027	51.78077
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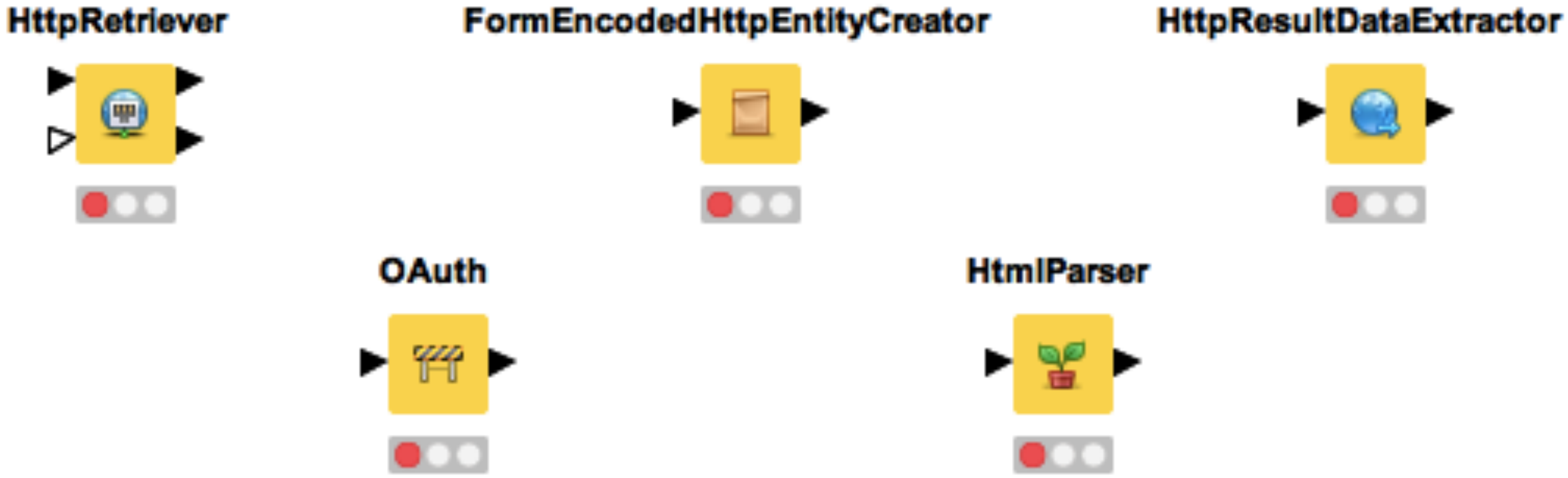
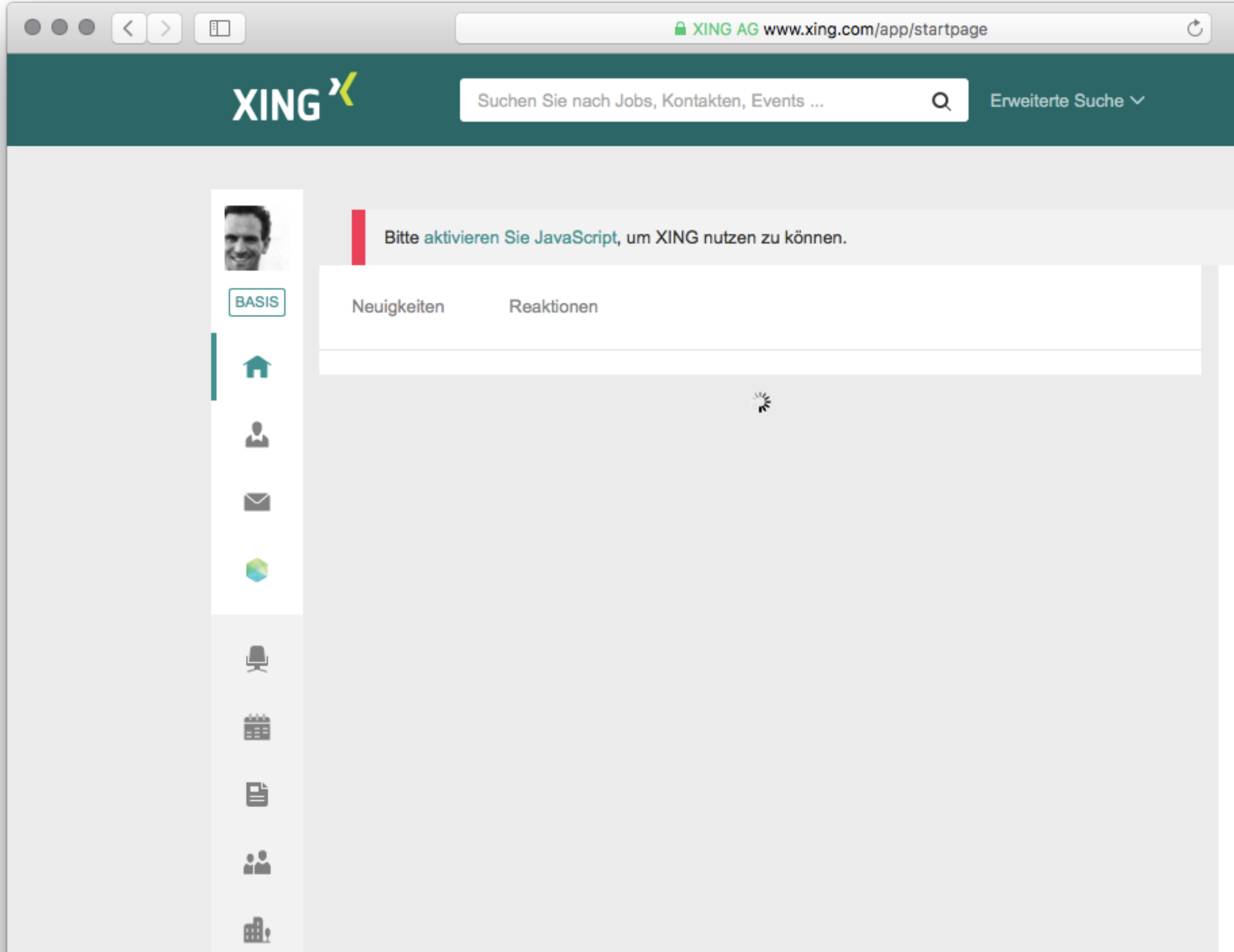
🟥	Row14	Ireland's outlying islands	Irelan...	Ireland	COUNTRY	-8.0	53.0

HTTP and HTML

- **New:** Support for cookies, headers, and further HTTP methods besides GET
- **New:** Sending arbitrary byte stream content, form-encoding of table data
- **New:** OAuth signing for HTTP requests

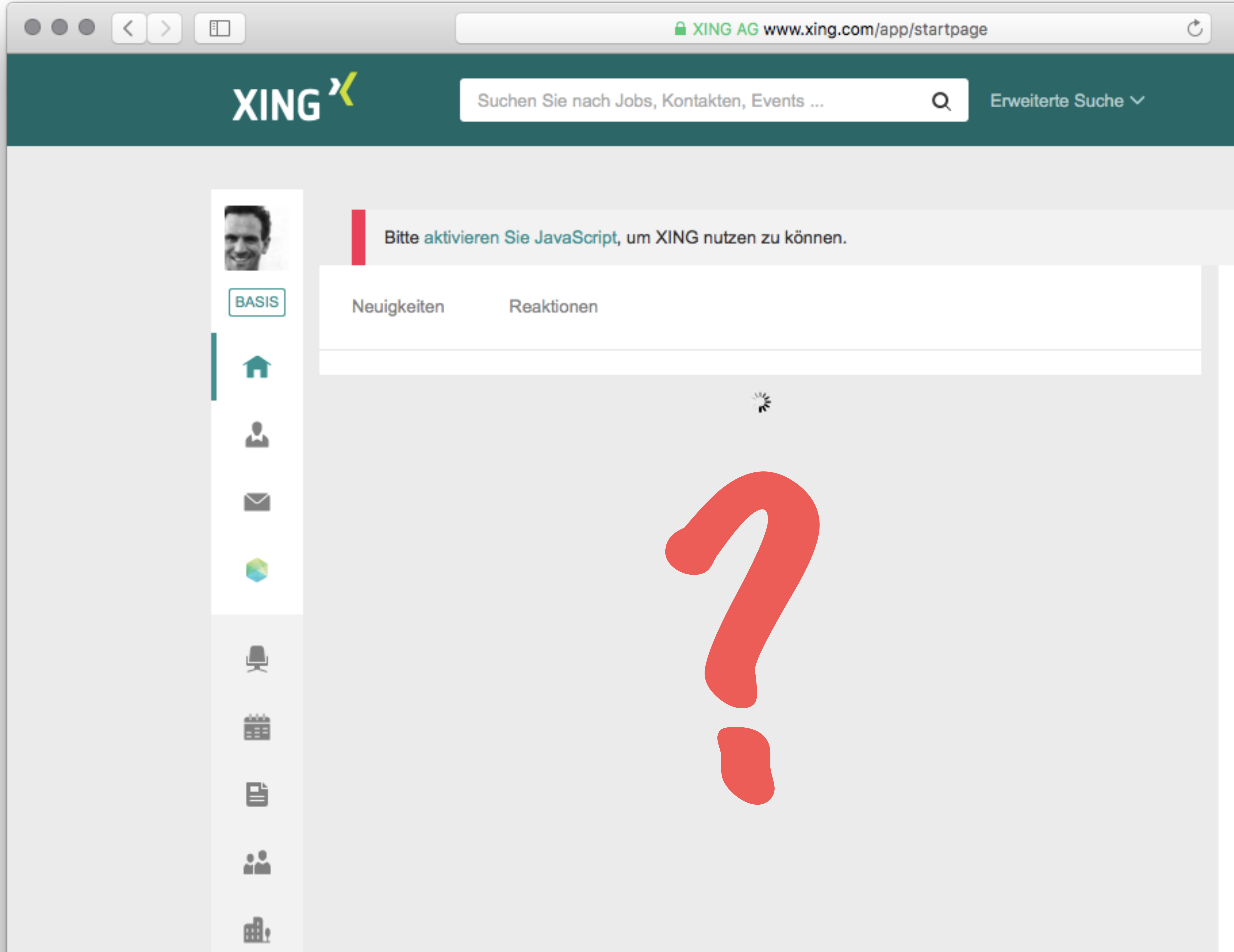




XING AG www.xing.com/app/startpage

Suchen Sie nach Jobs, Kontakten, Events ...

Bitte aktivieren Sie JavaScript, um XING nutzen zu können.



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Erweiterte Suche
BASIS
Neuigkeiten
Reaktionen

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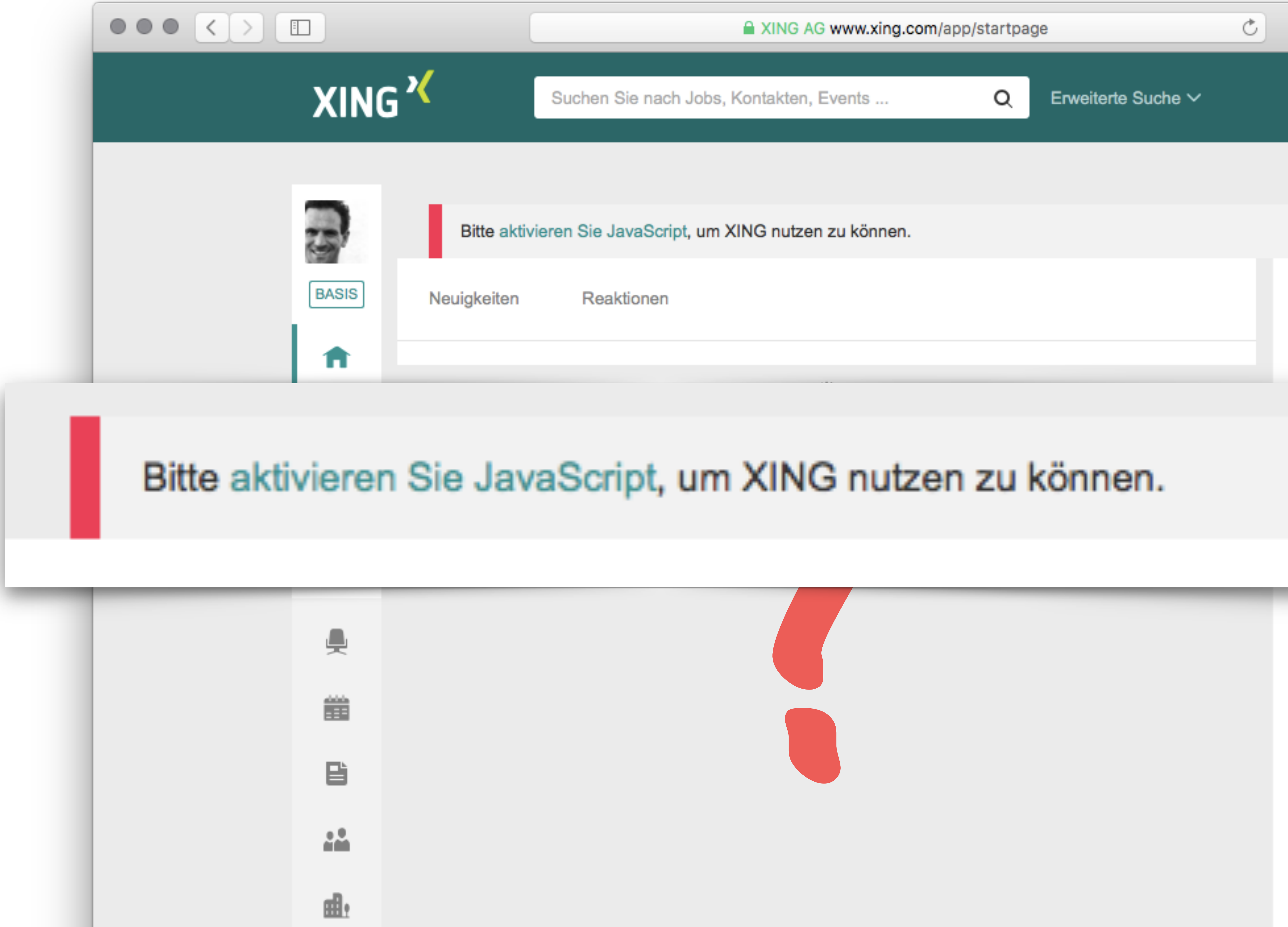
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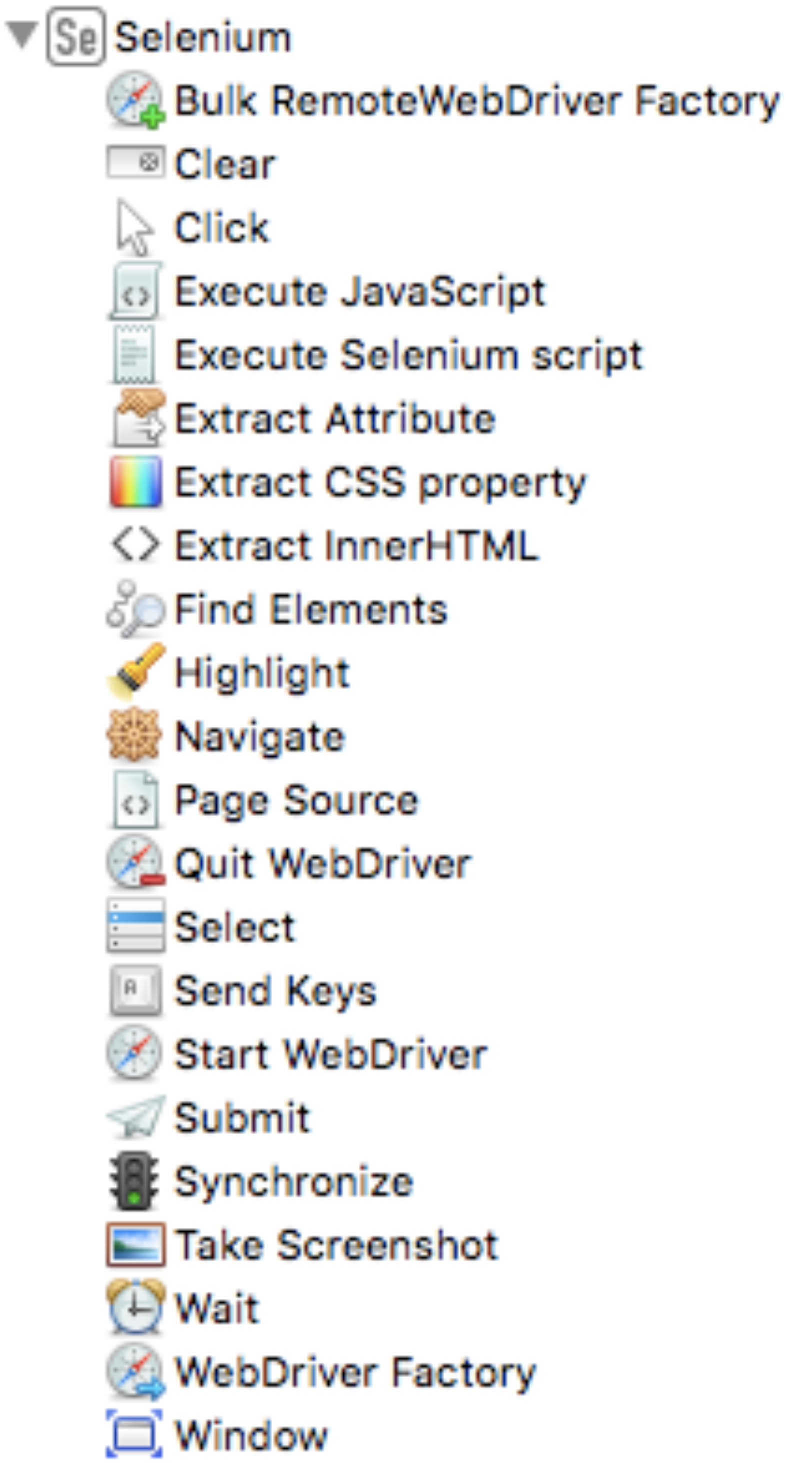
Selenium Nodes

Selenium?

- *"Selenium automates browsers."*
- The **Selenium Nodes** allow to simulate a *real* web browser with KNIME
- Use a KNIME workflow to describe actions and extract all the data you need



- Selenium
  - Bulk RemoteWebDriver Factory
  - Clear
  - Click
  - Execute JavaScript
  - Execute Selenium script
  - Extract Attribute
  - Extract CSS property
  - Extract InnerHTML
  - Find Elements
  - Highlight
  - Navigate
  - Page Source
  - Quit WebDriver
  - Select
  - Send Keys
  - Start WebDriver
  - Submit
  - Synchronize
  - Take Screenshot
  - Wait
  - WebDriver Factory
  - Window

Use Cases

Data extraction

Task automatization

Web application testing

Browser Support

- Local installations

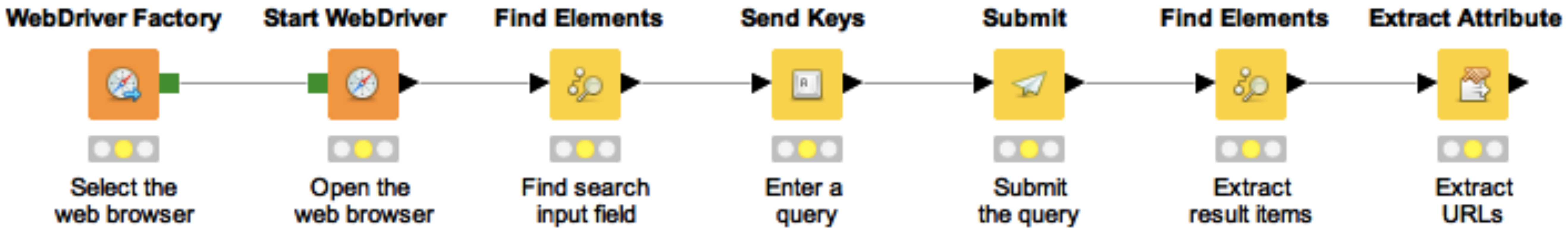
- Headless “browsers”
  - PhantomJS, jBrowserDriver

- Remotely running

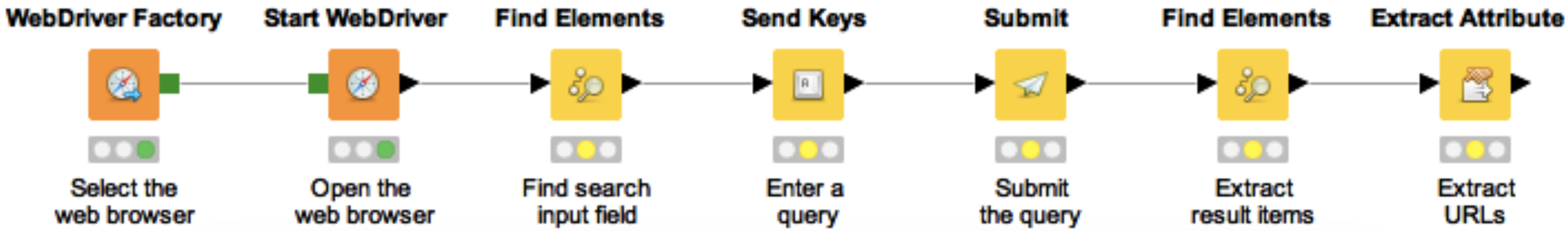
Browser Support

- Remotely running
  - Connect to Selenium servers or VMs on your local network to simulate a variety of operating systems or browsers
  - Use cloud services such as BrowserStack or SauceLabs, which provide ready-to-use Selenium instances (even iOS and Android)

Example Workflow



Example Workflow



WebDriver Factory — Select the web browser

Start WebDriver — Open the web browser

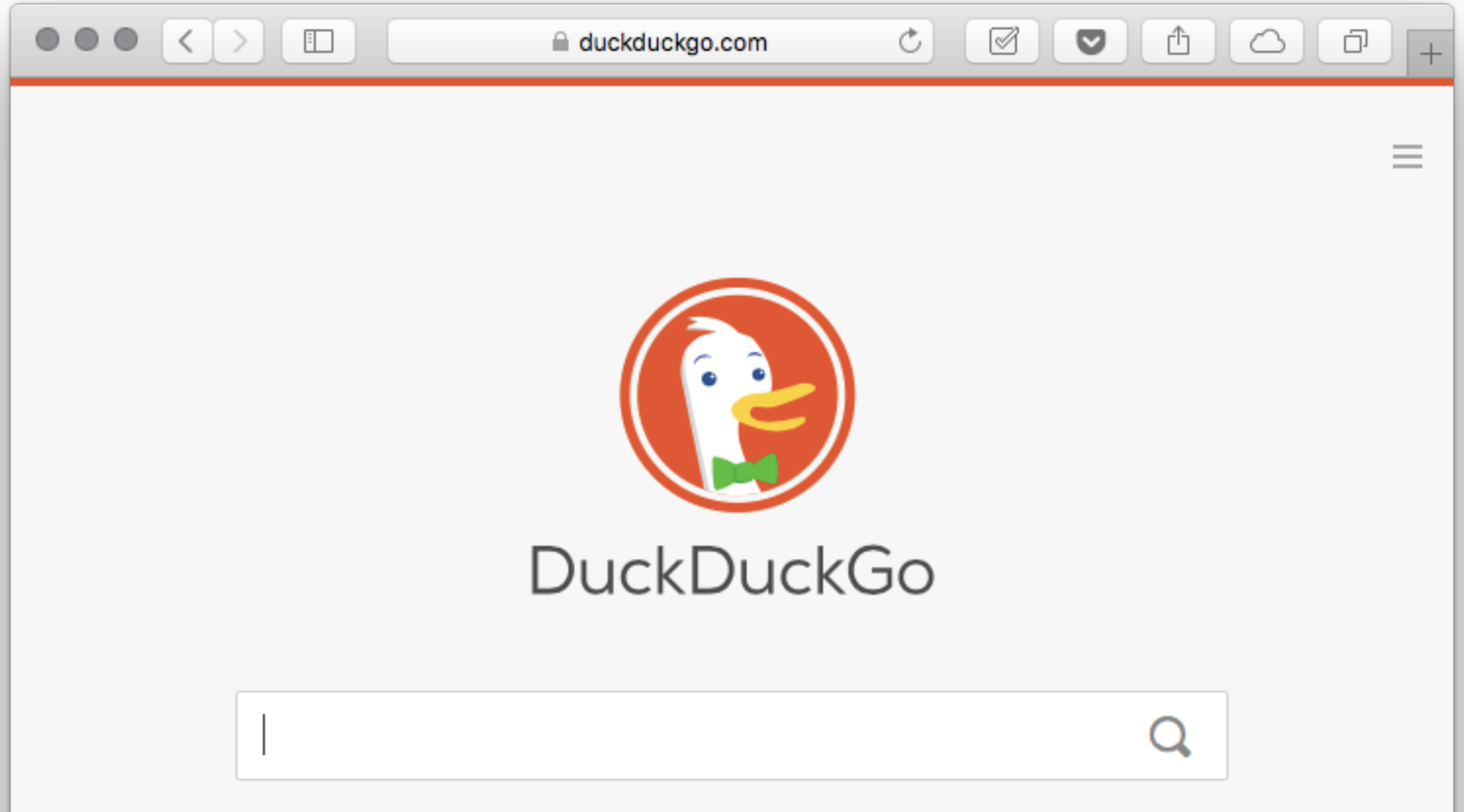
Find Elements — Find search input field

Send Keys — Enter a query

Submit — Submit the query

Find Elements — Extract result items

Extract Attribute — Extract URLs



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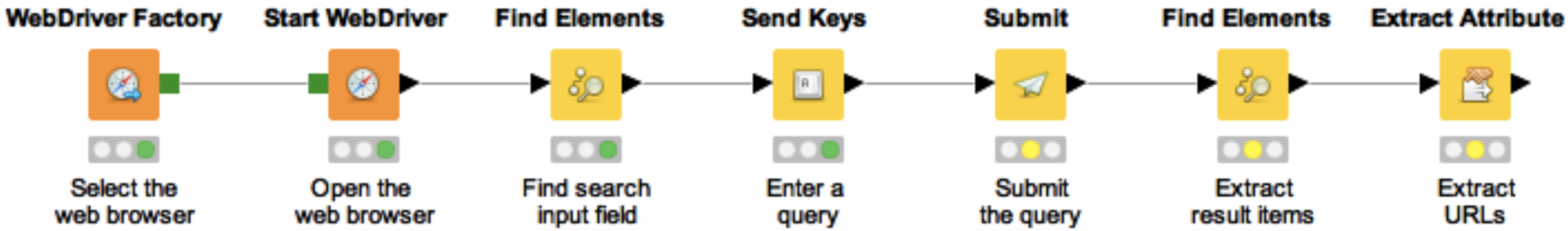

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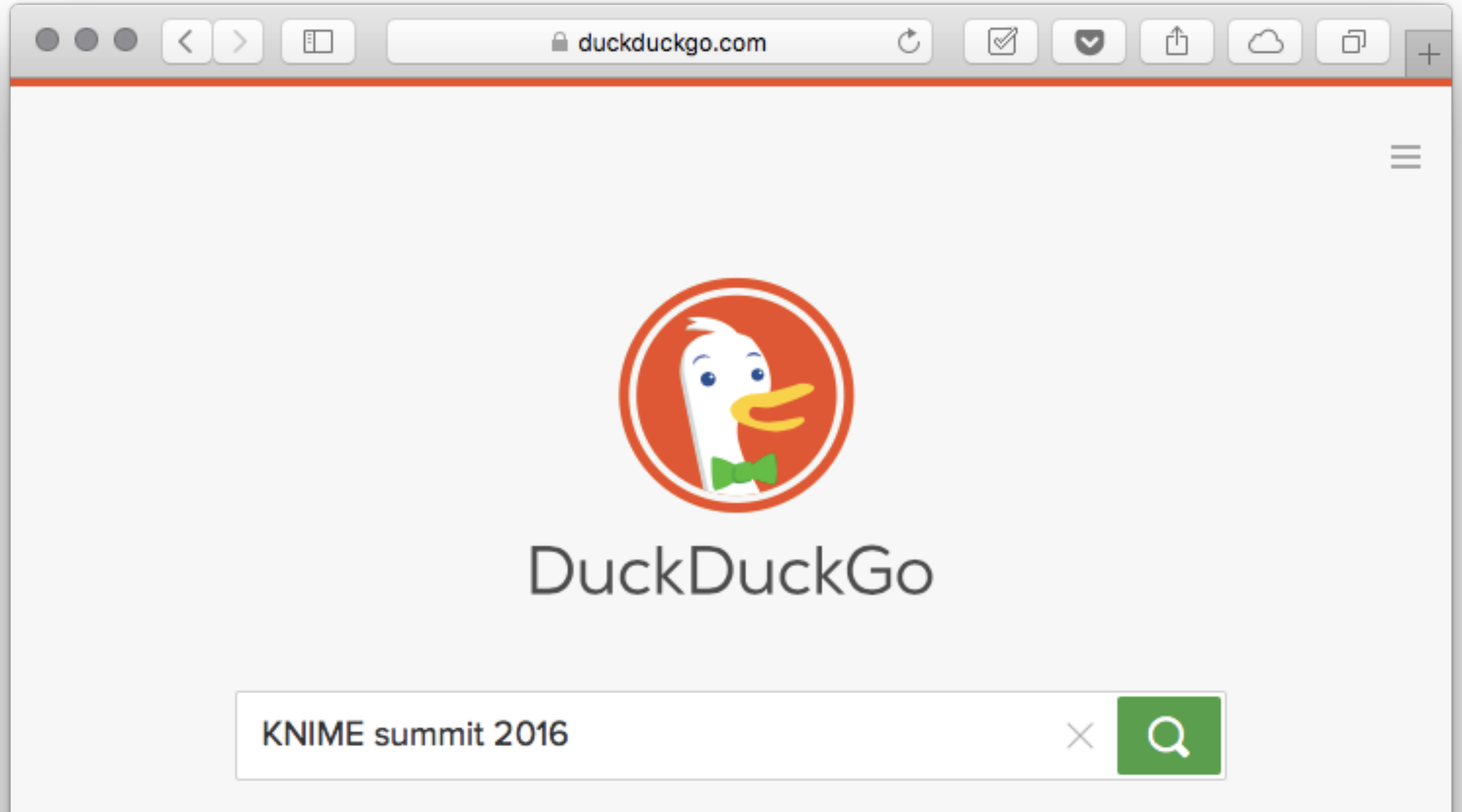
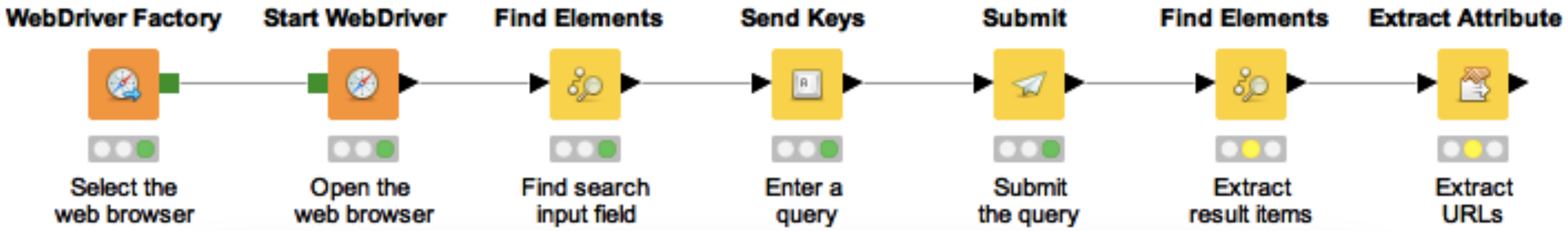


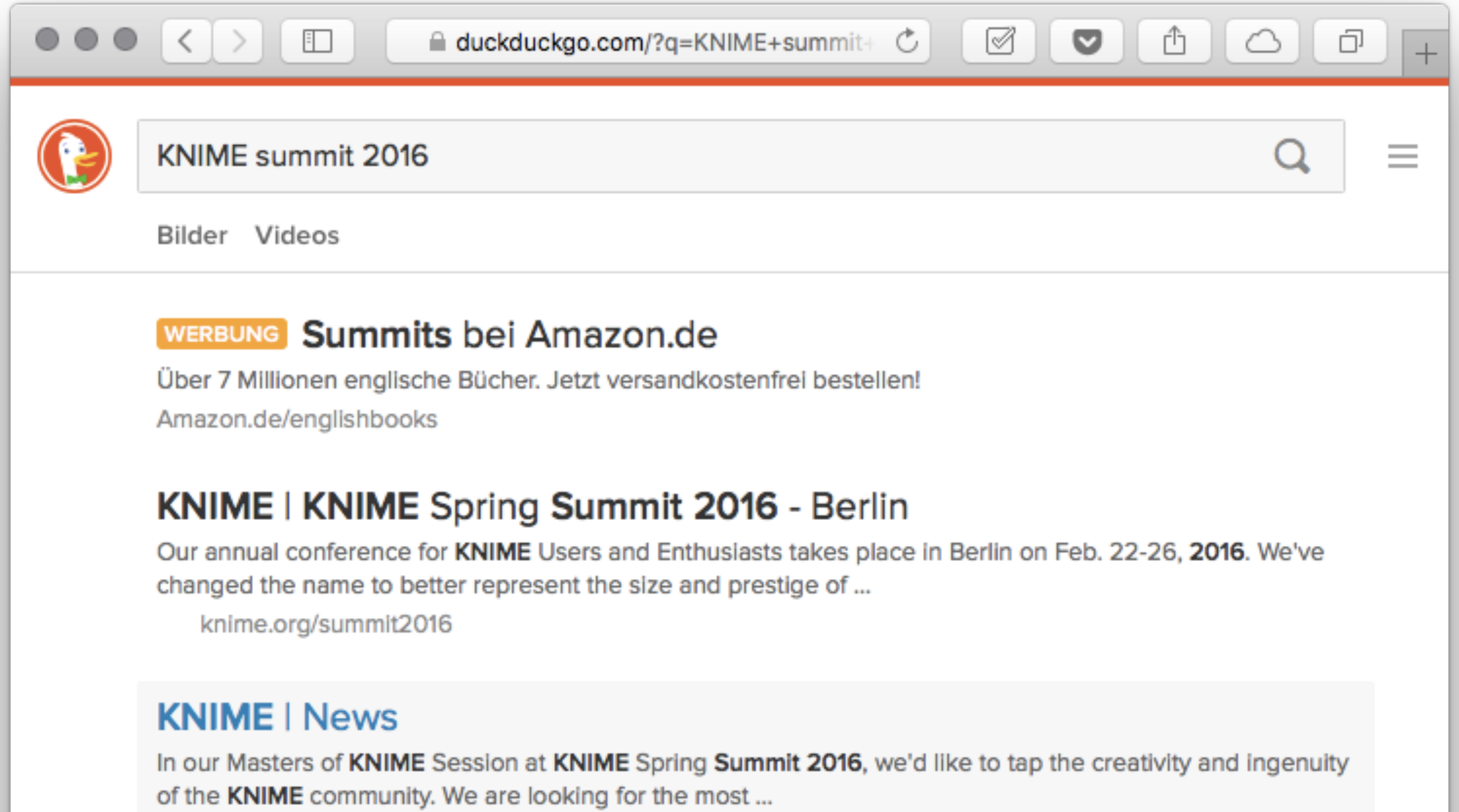
duckduckgo.com

DuckDuckGo

KNIME summit 2016

Example Workflow





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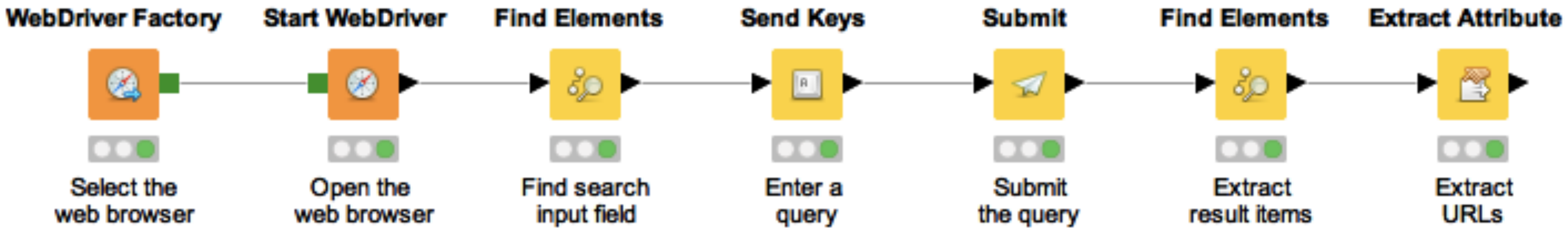
Our annual conference for **KNIME** Users and Enthusiasts takes place in Berlin on Feb. 22-26, **2016**. We've changed the name to better represent the size and prestige of ...

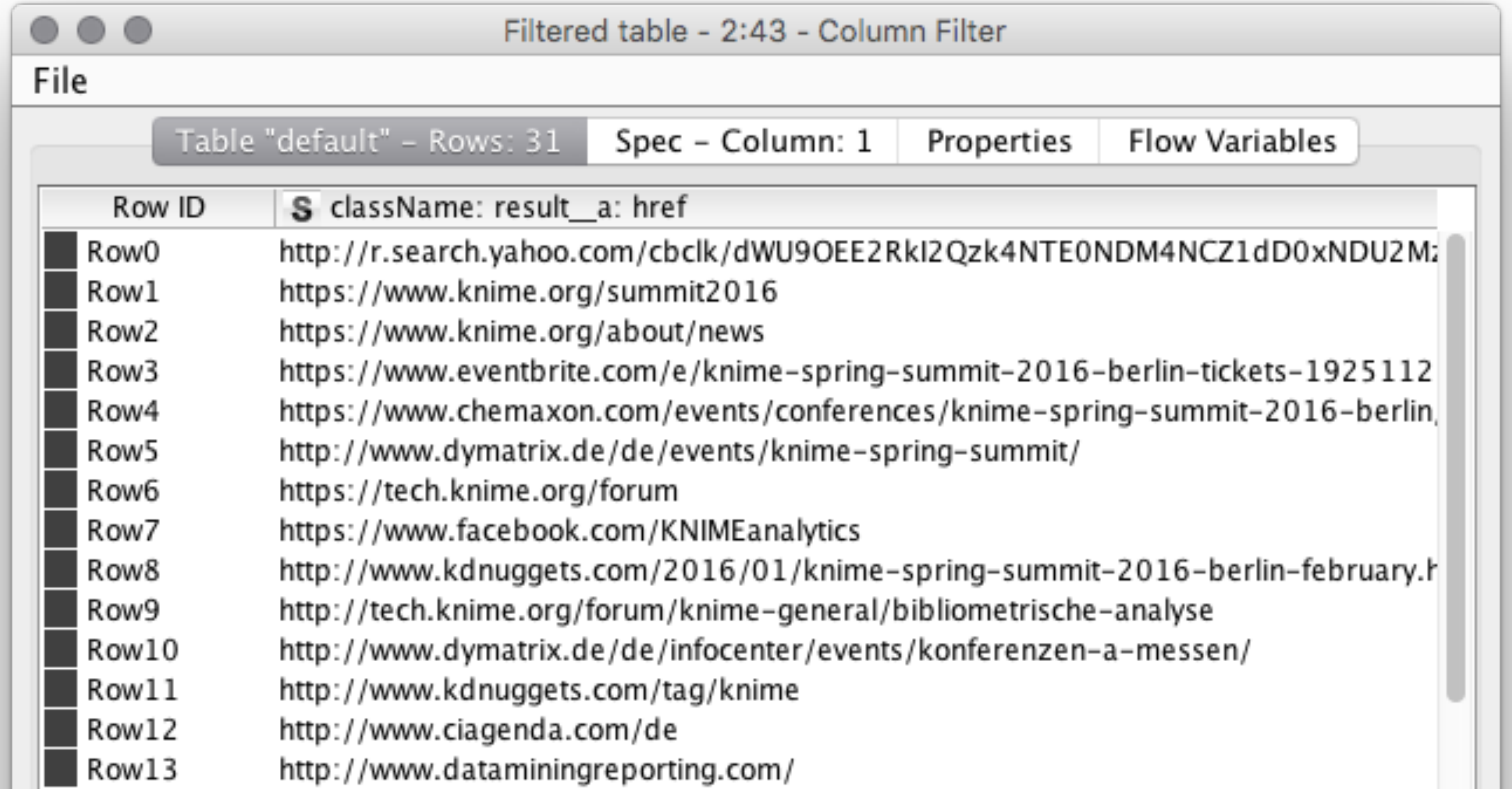
knime.org/summit2016

KNIME | News

In our Masters of **KNIME** Session at **KNIME** Spring **Summit 2016**, we'd like to tap the creativity and ingenuity of the **KNIME** community. We are looking for the most ...

Example Workflow




Filtered table - 2:43 - Column Filter
File
Table "default" – Rows: 31
Spec – Column: 1
Properties
Flow Variables

Row ID	className: result__a: href
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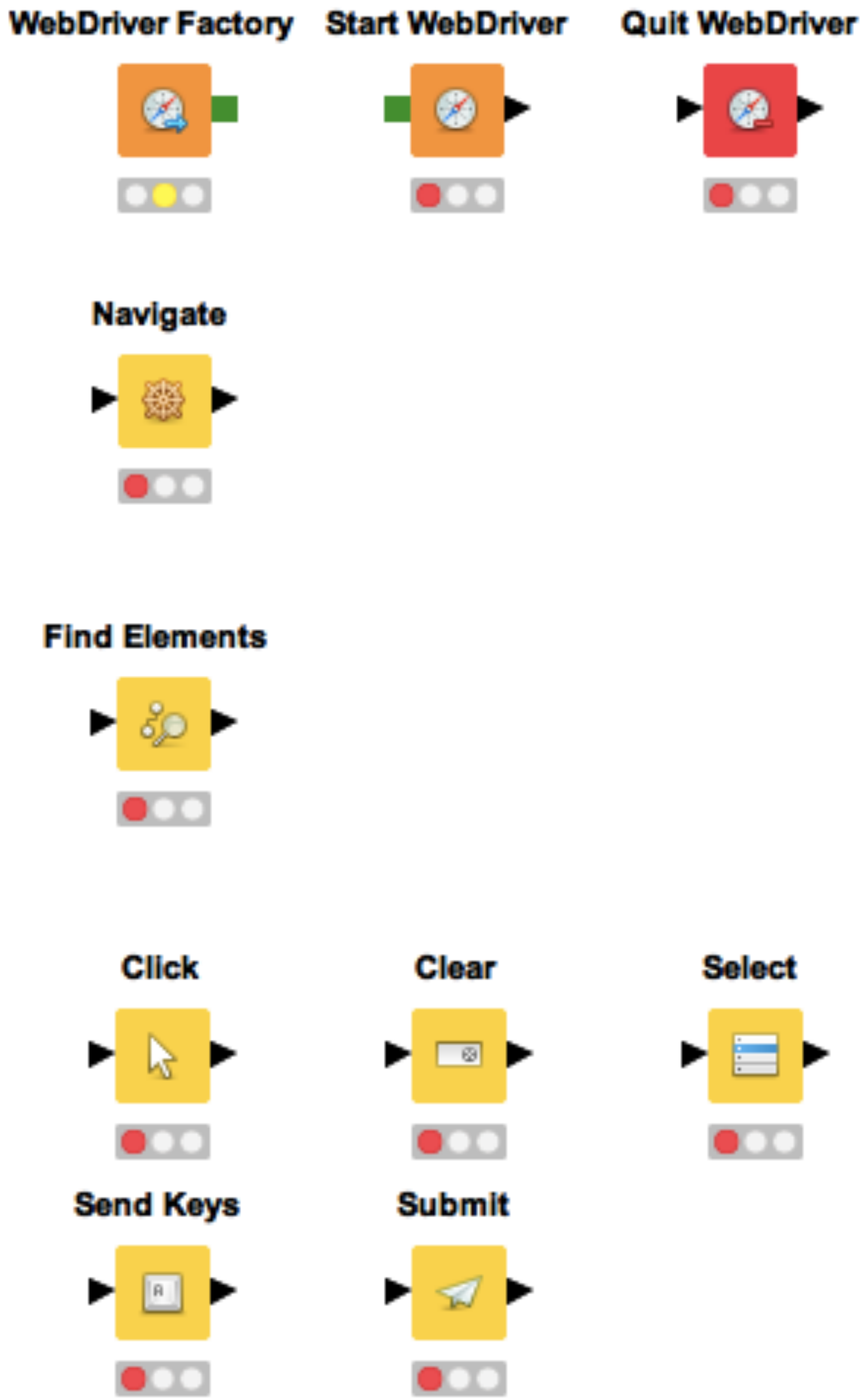
Row1	https://www.knime.org/summit2016
Row2	https://www.knime.org/about/news
Row3	https://www.eventbrite.com/e/knime-spring-summit-2016-berlin-tickets-1925112
Row4	https://www.chemaxon.com/events/conferences/knime-spring-summit-2016-berlin
Row5	http://www.dymatrix.de/de/events/knime-spring-summit/
Row6	https://tech.knime.org/forum
Row7	https://www.facebook.com/KNIMEanalytics
Row8	http://www.kdnuggets.com/2016/01/knime-spring-summit-2016-berlin-february.
Row9	http://tech.knime.org/forum/knime-general/bibliometrische-analyse
Row10	http://www.dymatrix.de/de/infocenter/events/konferenzen-a-messen/
Row11	http://www.kdnuggets.com/tag/knime
Row12	http://www.ciagenda.com/de
Row13	http://www.dataminingreporting.com/

Node Overview

- Configure, start, and quit web browsers
- Navigate
- Locate Elements (using attributes, XPath, or CSS)
- Interact with Elements (click, input text, select, submit, …)



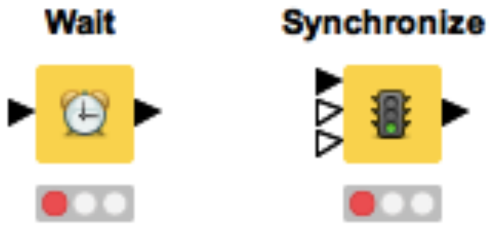
Node Overview

- Highlight elements
- Take screenshots

- Extract data (page source, text content, attributes, …)

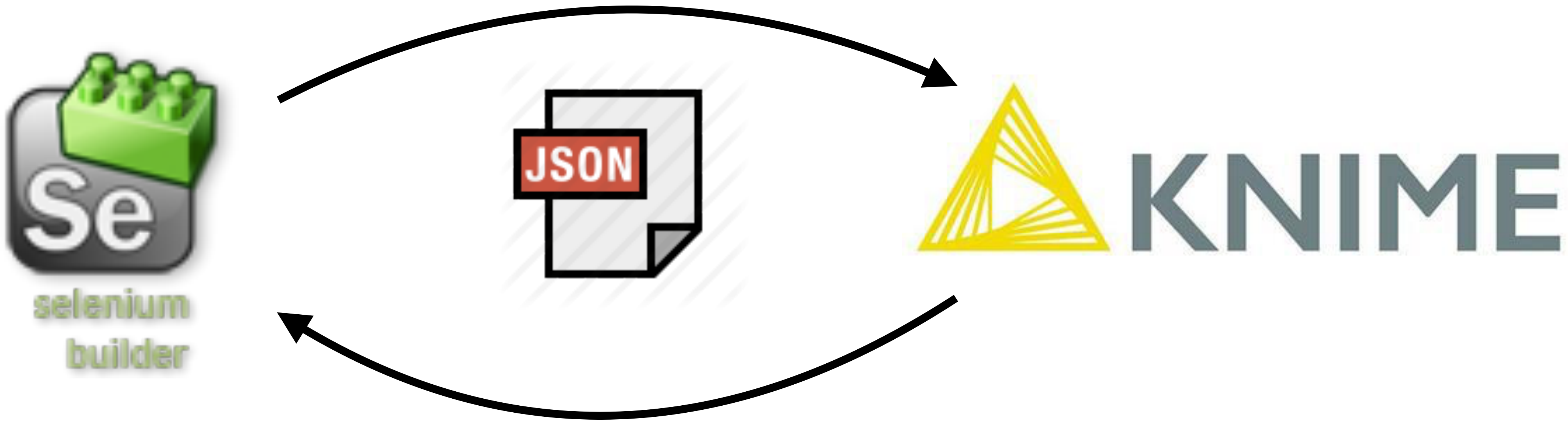
- Execute JavaScript
- Execute Selenium script

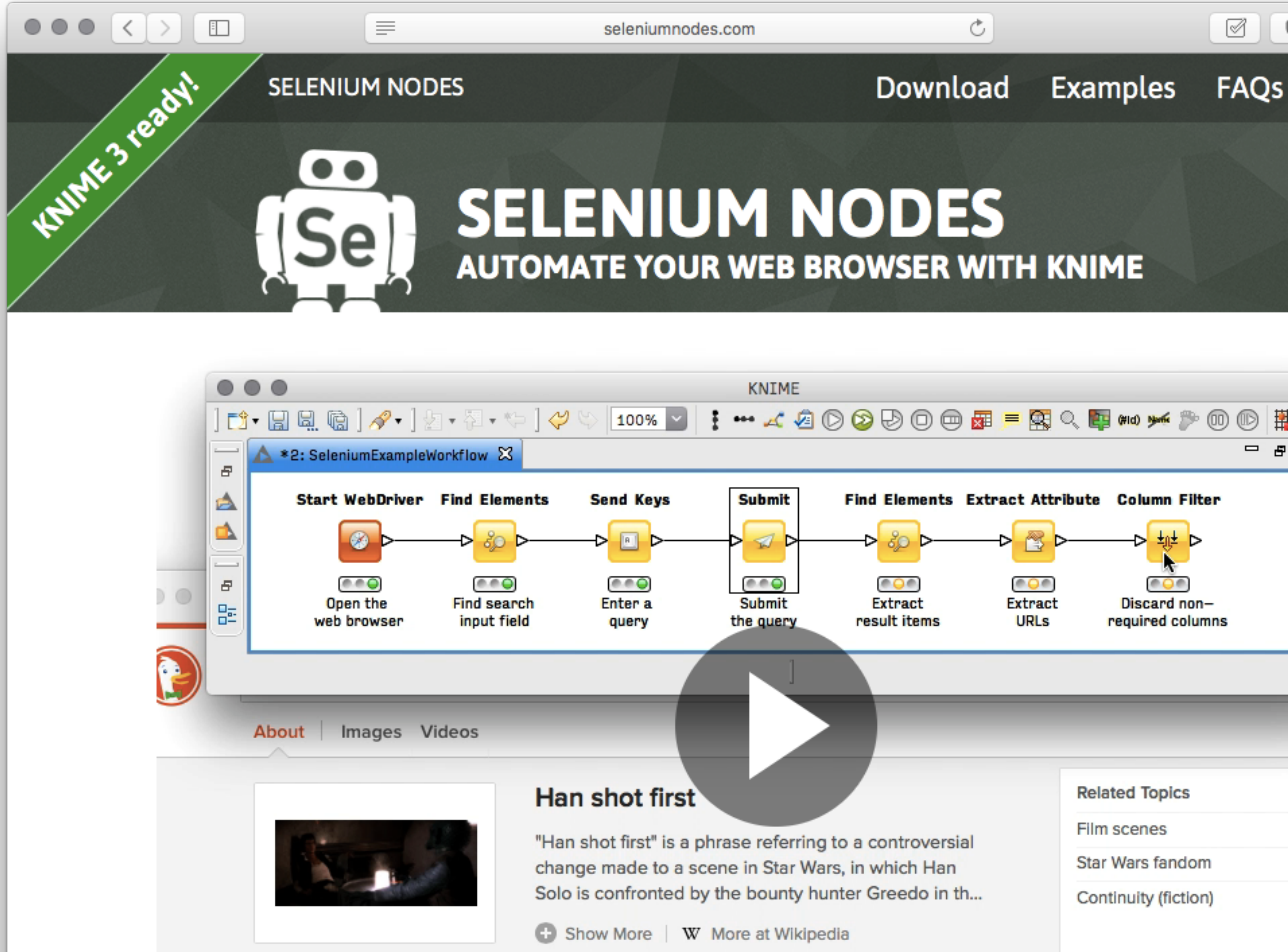
- **Waiting and synchronization**



Outlook

- More sample workflows
- Documentation, how-tos, …
- **Workflow import and export for Selenium Scripts**





SELENIUM NODES

AUTOMATE YOUR WEB BROWSER WITH KNIME

Han shot first

"Han shot first" is a phrase referring to a controversial change made to a scene in Star Wars, in which Han Solo is confronted by the bounty hunter Greedo in th...

Questions?
Get in touch!

mail@seleniumnodes.com
KNIME forum