Module 6: ANNIC

© The University of Sheffield, 1995-2016
This work is licensed under
the Creative Commons Attribution-NonCommercial-NoDerivs Licence

The art and craft of JAPE rules

- You know by now how to write some not so simple JAPE rules
- The question is: how do you design them? How do you find patterns which are frequent in your test corpus?
- Given a dataset of tweets, how can you be sure that the JAPE LHS pattern you are about to implement doesn't do more harm than good?

ANNIC: Annotations in Context

- Motivation
  - Need for a corpus analysis tool
  - Useful for authoring of IE patterns for rules

- … is an IR engine that can search over:
  - Document Content
  - Meta-data (Annotation types, features and values)

    for example: Person.gender==”male”

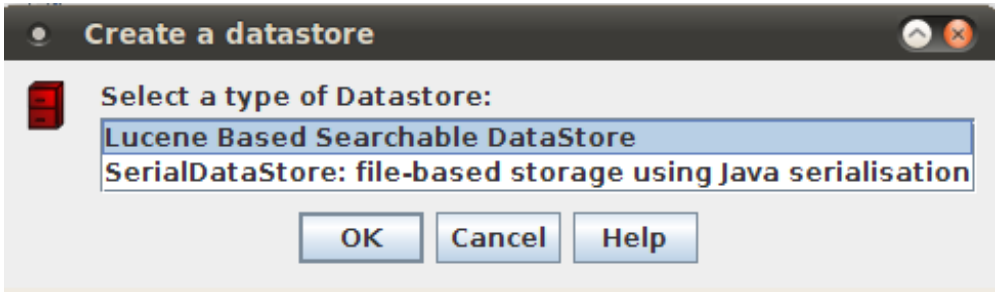
ANNIC

- … is based on Apache Lucene technology.
- … can index any document supported by GATE
- … is integrated in GATE as a Searchable Datastore
- … has an advanced GUI that provides:
  - view of annotation mark-ups over the matched patterns
  - Interactive way of developing new patterns
  - Annotation statistics

How does it work?

- Initialization
  - Where to store
  - What to Index and what to exclude
  - Context boundary (e.g. restricted within sentence or paragraph boundaries)
- Index actions linked with Datastore actions
- When document is saved, index or re-index if already indexed
- When document is deleted, delete it from the index

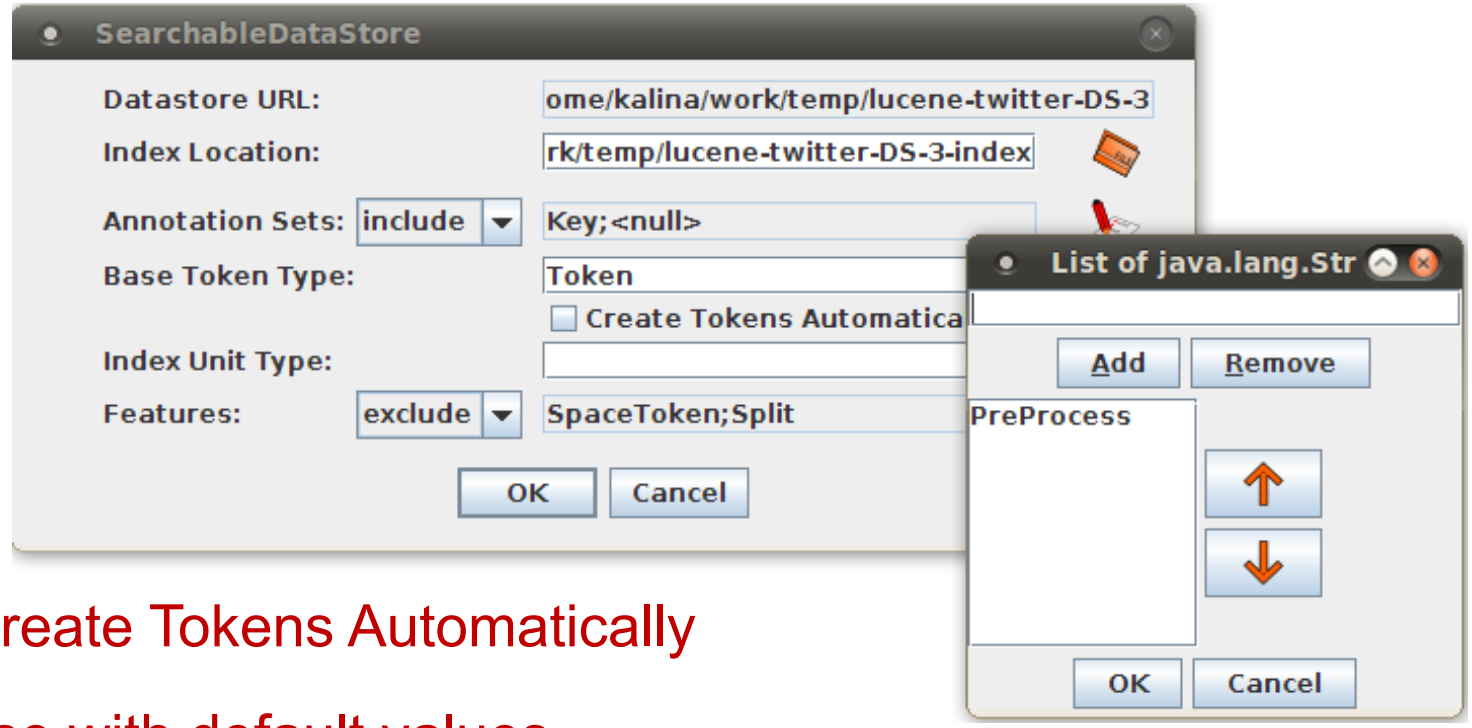
Creating a Datastore



- In GATE, right click on Datastores, then Create Datastore
- Specify a new empty directory for the index
- By default, the annotation sets to be indexed are the default set (<null>) and the Key set (where by convention we put gold-standard annotations
- We want to index only the PreProcess annotation set
- This needs to be specified at index creation time – we cannot change it later

Create Lucene Datastore (2)

- Click on the pencil button opposite Annotation Sets
- In the list box, delete the default values, type PreProcess and press the Add button



- Uncheck “Create Tokens Automatically
- Leave all else with default values
- Click OK, the new datastore is now ready to use

ANNIC: The Query Language

- JAPE –like LHS Pattern syntax
  - String within quotes or without quotes

    e.g. “ubuntu”
  - {AnnotationType}

    e.g. {Person}
  - {AnnotationType == string}

    e.g. {Organization == “University of Sheffield”}
  - {AT.featureName==value}

    e.g. {Person.gender == male}
  - {AT.feature==value, AT.feature==value}

    e.g. {Token.orth == “upperInitial”, Token.length == “3”}

ANNIC: The Query Language (2)

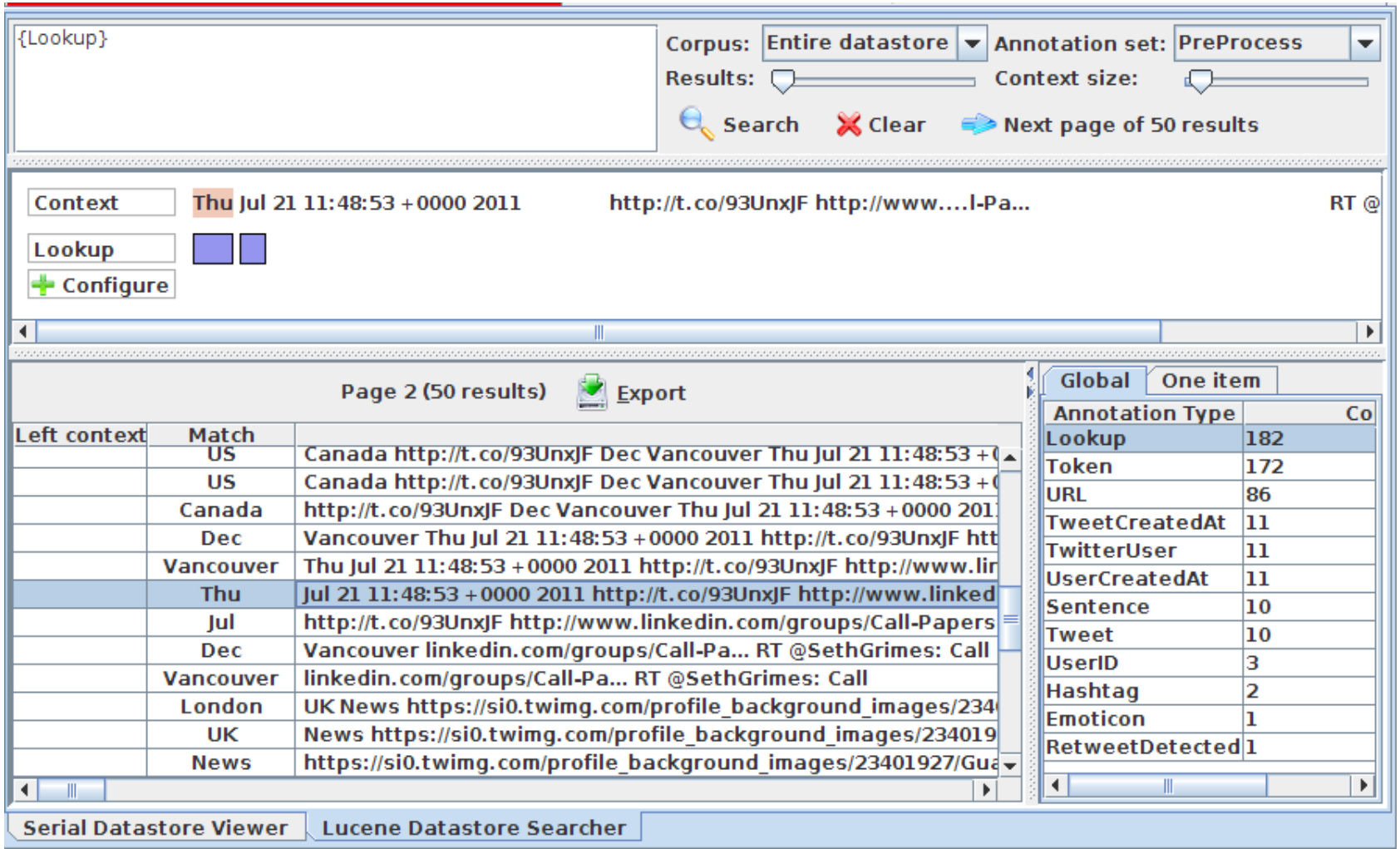
- Klene Operator + and * but they need to be quantified
  - {Person}{Token}*3{Organization} – find all Person and Organization annotations **within up to 3 tokens** of each other
- Logical | (OR) operator
  - {A}({B} | {C})
- Order of query terms is very important

Initiating ANNIC Pattern Searches

- Populate a corpus from the **annic-documents** directory
- Save the corpus to the newly created Lucene Datastore
- Double click on the datastore
- Click on the “Lucene Datastore Searcher” tab at the bottom
- This opens the ANNIC GUI
- Choose over which annotation set you wish to search (top right). By default you are searching over all sets, but this is confusing, especially if you have many sets
- Enter a test ANNIC query (e.g. {Lookup} or {Hashtag}) in the big search field, then press Search

Example: Building a Date pattern

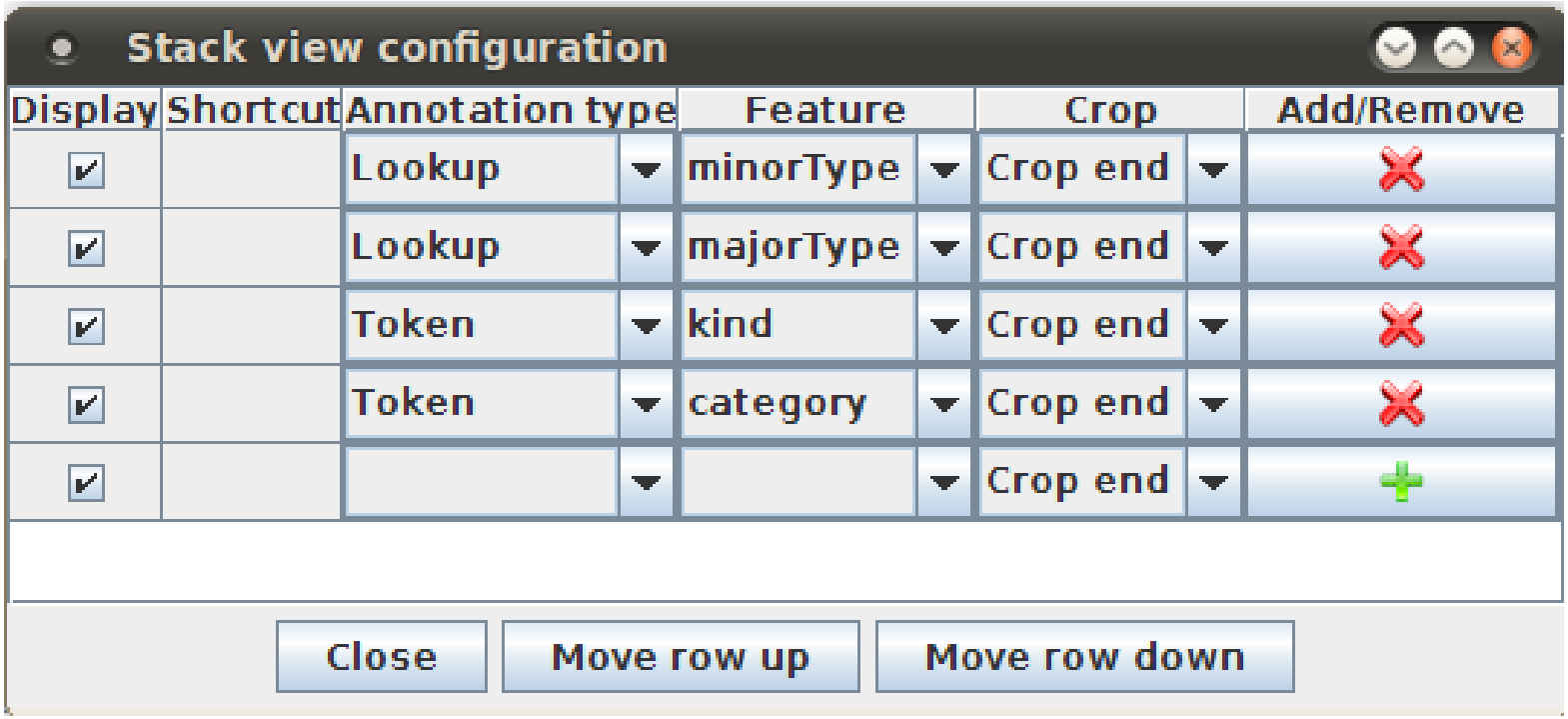
- Let us first start by checking the {Lookup} annotations in the PreProcess set and the context in which they appear



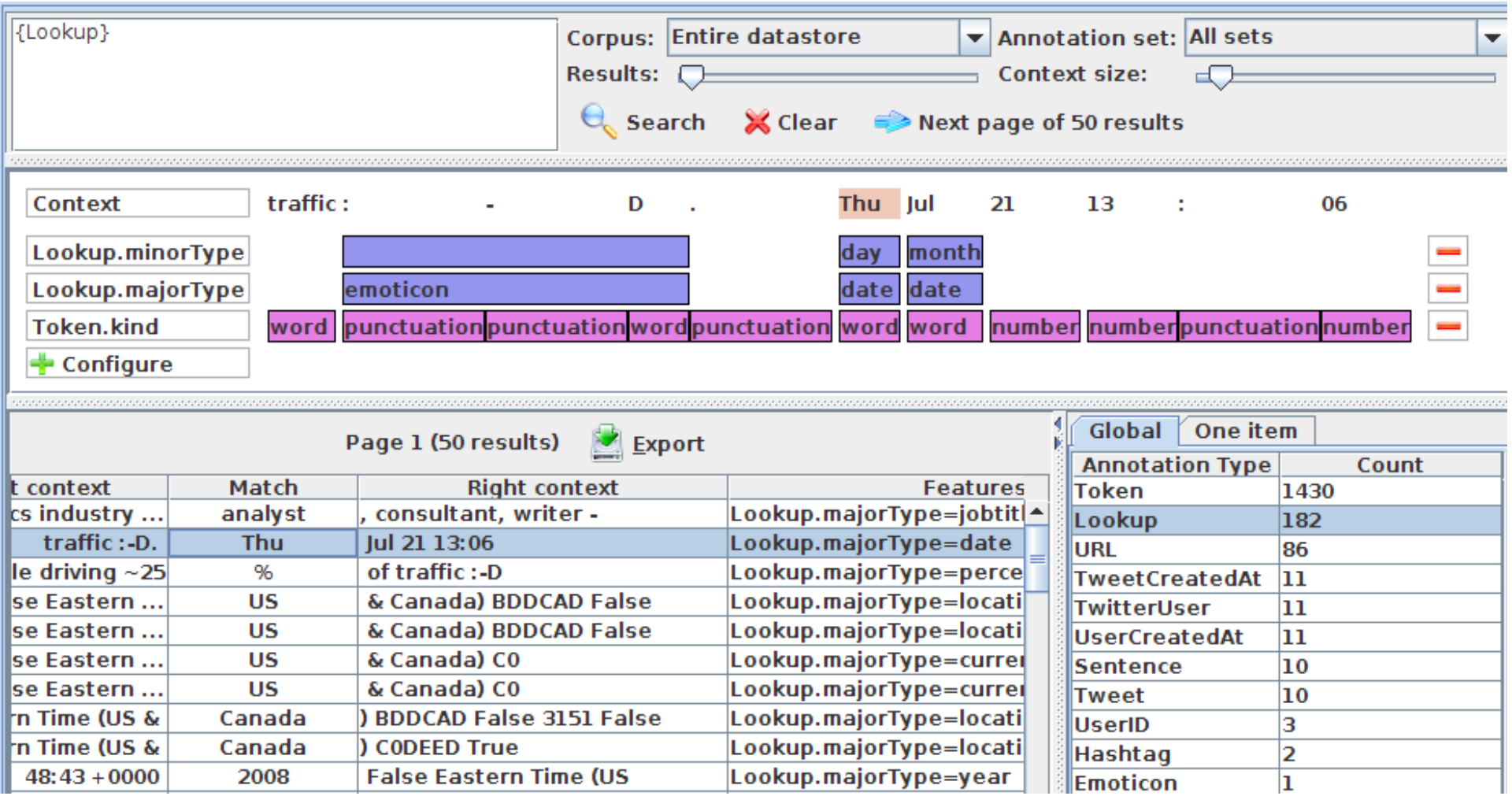
Seeing More Context

- Click the Configure button

- In the dialog box, keep adding rows for the annotation types (and optionally features) that you'd like displayed in the viewer
- A good set for our example is this:



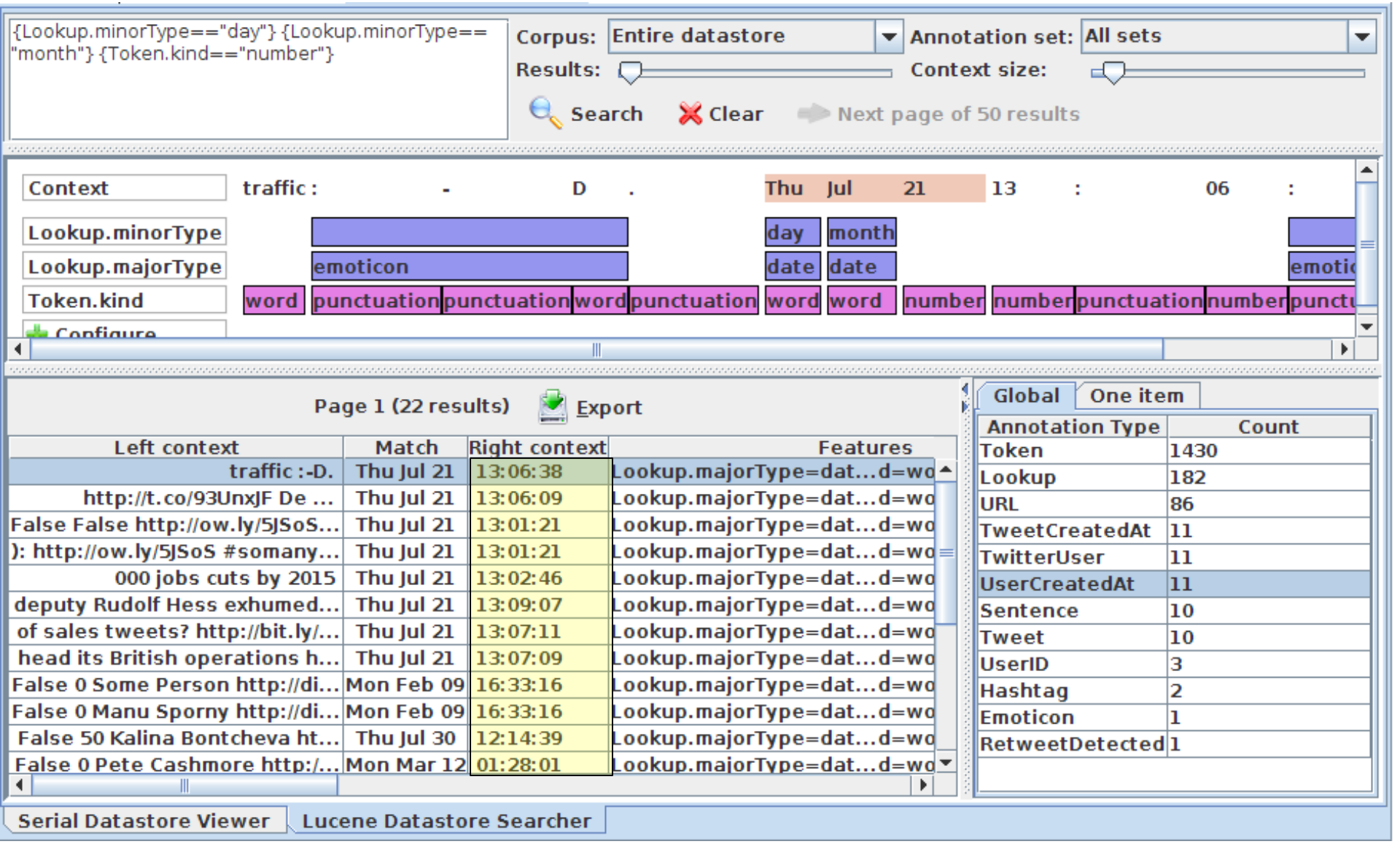
Seeing More Context (2)



Building Up A Date Pattern

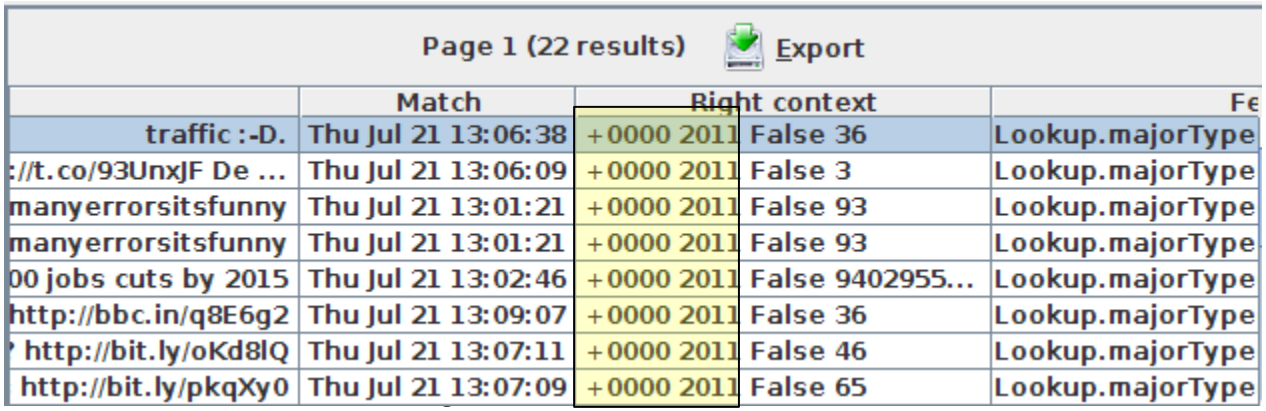
- Let's look for dates which contain a day of the week
- We start the query by typing {Lookup.minorType=="day"}
- 22 results are returned and we can see from inspection that the subsequent word is typically a Lookup of type month
- Expand the query: {Lookup.minorType=="day"} {Lookup.minorType=="month"}
- This still returns 22 results, which means we haven't lost anything or introduced noise
- From inspection, we notice that what follows next is a number. These can be recognised from Token.kind == "number"
- Final Date LHS pattern: {Lookup.minorType=="day"} {Lookup.minorType=="month"}{Token.kind=="number"}

Example Results



Hands-on: Expand to include the time

- Double-click on the datastore, open the ANNIC GUI
- In the ANNIC GUI:
  - Expand the pattern to include the time expressions



Page 1 (22 results) Export

	Match	Right context		Fe
traffic :-D.	Thu Jul 21 13:06:38	+0000 2011	False 36	Lookup.majorType
://t.co/93UnxJF De ...	Thu Jul 21 13:06:09	+0000 2011	False 3	Lookup.majorType
manyerrorsitsfunny	Thu Jul 21 13:01:21	+0000 2011	False 93	Lookup.majorType
manyerrorsitsfunny	Thu Jul 21 13:01:21	+0000 2011	False 93	Lookup.majorType
00 jobs cuts by 2015	Thu Jul 21 13:02:46	+0000 2011	False 9402955...	Lookup.majorType
http://bbc.in/q8E6g2	Thu Jul 21 13:09:07	+0000 2011	False 36	Lookup.majorType
' http://bit.ly/oKd8lQ	Thu Jul 21 13:07:11	+0000 2011	False 46	Lookup.majorType
http://bit.ly/pkqXy0	Thu Jul 21 13:07:09	+0000 2011	False 65	Lookup.majorType

Converting the Pattern to a JAPE Rule

- You might wish to create several different annotations from this JAPE LHS, e.g. Date, Time, and Offset
- Use different named blocks in the pattern to achieve this
- We leave this as homework, especially if you wish to link the year (which appears at the end) with the rest of the date
- A relevant PR here is the DateNormalizer:
  - http://gate.ac.uk/userguide/sec:misc-creole:datenormalizer