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ANNIS workshop

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- Search and Visualization in Multilayer Linguistic Corpora
 - Imports existing corpora
 - Corpora already have to be annotated, ANNIS only uses what's there
 - No NLP!



- Search and Visualization in Multilayer Linguistic Corpora
 - Makes corpora searchable
 - One query language for all corpora (AQL)
 - Abstraction over linguistic data necessary
 - But: Corpora have different annotations → query has to match the annotations



- Search and Visualization in Multilayer Linguistic Corpora
 - Displays corpora
 - Many visualizations available
 - Corresponding to type of annotation (syntactic trees, phrase trees (RST), grids, coreferences ...)



- What ANNIS cannot do
 - Does not know how to speak natural language
→ so you have to learn AQL



- What ANNIS cannot do
 - Does not know how to speak natural language
→ so you have to learn AQL
 - ANNIS does not know any semantics
→ „NN“, „NP“, „sentence“, „word“, „my favorite annotation“ ... are just sequences of characters



- What ANNIS cannot do
 - Does not know how to speak natural language
 - so you have to learn AQL
 - ANNIS does not know any semantics
 - „NN“, „NP“, „sentence“, „word“, „my favorite annotation“ ... are just sequences of characters
 - You need to be exact
 - e.g. „POS“ != „pos“ and „NN“ != „NN “ (regard the blank)



ANNIS: Search and
Visualization in
Multilayer Linguistic
Corpora

ANNIS basics

ANNIS basics



ANNIS: Search and Visualization in Multilayer Linguistic Corpora

cat="NP"

Search More History

Status: Ok

Corpus List Search Options

Visible: All

Name	Texts	Tokens		
pcc2	2	399		
RIDGES_Herbology_\	22	122.698		
RIDGES_Herbology_\	29	154.266		

Help/Ex Tutorial Example Queries

Exam	Description	
lemm	search for all words with the lemma "sein" in documents	pcc2
meta:	search for all words with the meta: "Sport"	
exma	search for all Inf-Stat annotations with the value "exmaralda"	pcc2
"statisch"	search for the word "statisch"	pcc2
lemmal!="sein"	search for all words where the lemma is not "sein"	pcc2
tok!="ist"	search for all words that are not "ist"	pcc2
/.lich	search for words ending with "lich" (regular expression)	pcc2

not logged in Login

Annotations: Enter query, Virtual Keyboard (e.g. arabic), Previous queries, Corpus list



ANNIS: Search and Visualization in Multilayer Linguistic Corpora

cat="NP"

Search

Status: Off

Corpus List

Visible: All

Name	Texts	Tokens		
pcc2	2	399		
RIDGES_Herbology_\	22	122.698		
RIDGES_Herbology_\	29	154.266		

Help/Examples

Tutorial

Example Queries

Example Query	Description	open corpus browser
lemma="sein" & meta::Genre="Sport"	search for all words with the lemma "sein" in documents from the Genre "Sport"	pcc2
exmaralda:Inf-Stat="new"	search for all Inf-Stat annotations with the value "new" in the "exmaralda" namespace	pcc2
"statisch"	search for the word "statisch"	pcc2
lemma!="sein"	search for all words where the lemma is not "sein"	pcc2
tok!="ist"	search for all words that are not "ist"	pcc2
/.*lich/	Search for words ending with "lich" (regular expression)	pcc2

Sample queries (corresponding to corpus)



ANNIS: Search and Visualization in Multilayer Linguistic Corpora

The screenshot displays the ANNIS search interface. On the left, a search box contains 'cat="NP"'. Below it, a 'Query Builder' and 'History' section are visible. A 'Search' button and a 'More' dropdown are present. Below these, it shows '41 matches in 2 documents'. A 'Corpus List' section is also visible, showing a table of corpora.

Name	Texts	Tokens
pcc2	2	399
RIDGES_Herbology_\	22	122.698
RIDGES_Herbology_\	29	154.266
Ridges_Herbology_Ve	13	60.811

The main search results area shows a table of results for the query 'cat="NP"'. The first result is highlighted, showing the path 'pcc2 > 11299 (tokens 1 - 10)'. The table displays the original text and its morphological and syntactic annotations.

Feigenblatt	Die	Jugendlichen	in	Zossen	wollen	ein	M...
Feigenblatt	der	jugendliche	in	Zossen	wollen	ein	M...
Nom.Sg.Neut	Nom.Pl.*	Nom.Pl.*	-	Dat.Sg.Neut	3.Pl.Pres.Ind	Acc.Sg.Neut	Ac...
NN	ART	NN	APPR	NE	VMFIN	ART	NP

Below the table, there are options for visualizations: dependencies (arches), information structure (grid), discourse referents (grid), and constituents (tree). A red box labeled 'Visualizations' points to these options.

The constituents (tree) visualization shows a syntactic tree for the sentence 'Die Jugendlichen in Zossen wollen ein Musikcafé Das'. The root node is 'S', which branches into 'SB', 'HD', and 'OA'. 'SB' branches into 'NP' (circled in red), 'MNR', and 'PP'. 'NP' branches into 'NK' and 'NK'. 'MNR' branches into 'AC' and 'NK'. 'PP' branches into 'AC' and 'NK'. 'HD' branches into 'wollen'. 'OA' branches into 'NP', which further branches into 'NK' and 'NK'. 'S' branches into 'OA', which branches into 'Das'.



ANNIS: Search and Visualization in Multilayer Linguistic Corpora

The screenshot displays the ANNIS search interface. On the left, a search results list shows various corpora with columns for Name, Texts, and Tokens. The 'pcc2' corpus is selected. A red box highlights the 'Corpus metadata window' on the right, which provides detailed information for the selected corpus. This window is divided into two main sections: 'Metadata' and 'Available annotations'.

Corpus metadata window

Select corpus/document: pcc2

Name	Value
URL	link
annotation_description	POS, lemma, morphology, constituent and dependency syntax, information structure, coreference, rhetorical structure, article headings
annotation_levels	pos;lemma;morph;Inf-Stat;Focus_newInf;PP;NP;Topic;Sent;Foc_c (for dominance egdes);dep:func (for dependency pointing relations);anaphor_antecedent (pointing relations)
full_name	Potsdam Commentary Corpus (sample of 2 documents)
language	German
source	Project D1, SFB 632
version	6.0

Available annotations

Name	Example (click to use query)	URL
exmaralda:Focus	exmaralda:Focus_newInf="nf-unsol"	↔
exmaralda:headi	exmaralda:heading="heading"	↔
exmaralda:Inf-St	exmaralda:Inf-Stat="giv-active"	↔
exmaralda:NP	exmaralda:NP="NP"	↔
exmaralda:PP	exmaralda:PP="PP"	↔
exmaralda:Sent	exmaralda:Sent="s"	↔
exmaralda:Topic	exmaralda:Topic="ab"	↔
mmax:ambiguity	mmax:ambiguity="not_ambig"	↔
mmax:anaphor_i	mmax:anaphor_type="anaphor_nomin	↔
mmax:complex_	mmax:complex_np="no"	↔
mmax:dir_speec	mmax:dir_speech="text_level"	↔
mmax:grammati	mmax:grammatical_role="other"	↔
mmax:np_form	mmax:np_form="defnp"	↔
mmax:phrase_ty	mmax:phrase_type="np"	↔
mmax:referentia	mmax:referentiality="discourse-new"	↔
mmax:type	mmax:type="none"	↔
rst:kind	rst:kind="segment"	↔

Link to corpus: https://korpling.german.hu-berlin.de/annis3/#_c=cGNjMg

Die Jugendlichen in Zossen wollen ein Musikcafé . Das forderten sie



ANNIS: Search and Visualization in Multilayer Linguistic Corpora

Document metadata

Document metadata window

1 Path: pcc2 > 11299 (tokens 1 - 10)

Feigenblatt	Die	Jugendlichen	in	Zossen	wollen	ein
Feigenblatt	der	jugendliche	in	Zossen	wollen	ein
Nom.Sg.Neut						Acc.Sg.Neut
NN						ART

dependencies (arch...)
information structur...
discourse referents...
constituents (tree)

Info for salt:/pcc2/11299

Metadata

document: 11299

Name	Value
Dokumentname	pcc-11299
Genre	Politik
Titel	Feigenblatt

corpus: pcc2

```
graph TD
    NP1[NP] --- NK1[NK]
    NP1 --- NK2[NK]
    NP1 --- MNR[MNR]
    NP1 --- PP[PP]
    NP1 --- V[V]
    NP1 --- NP2[NP]
    NP1 --- S[S]
    MNR --- AC[AC]
    MNR --- NK3[NK]
    S --- NK4[NK]
    S --- NK5[NK]
    OA[OA] --- Das[Das]
```



- Basic principles of AQL (ANNIS Query Language)
 - Attributes and values
 - Searching for exact character sequences
 - Searching for patterns
 - Combinatory search



- Corpus for demonstration: pcc2 (a sub corpus of pcc)

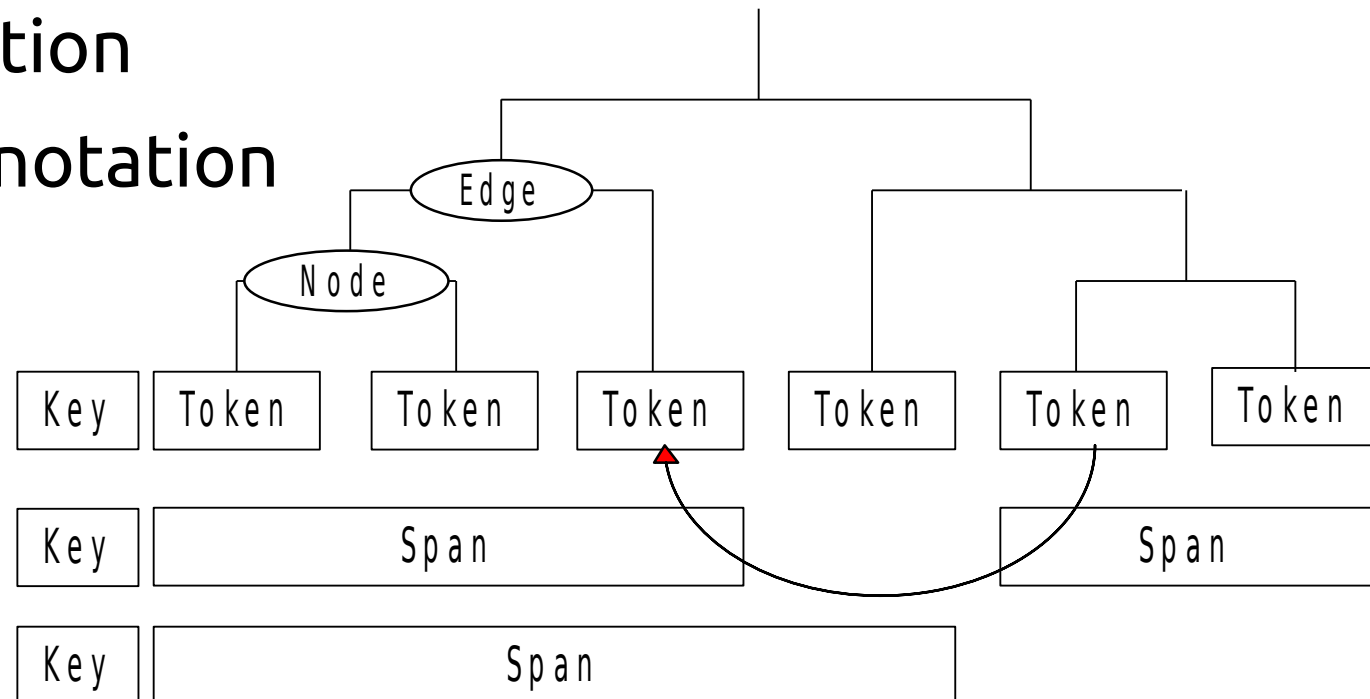
https://korpling.german.hu-berlin.de/annis3/#_c=cGNjMg

- Potsdam Commentary Corpus
 - German Newspaper commentaries
'Märkische Allgemeine Zeitung'

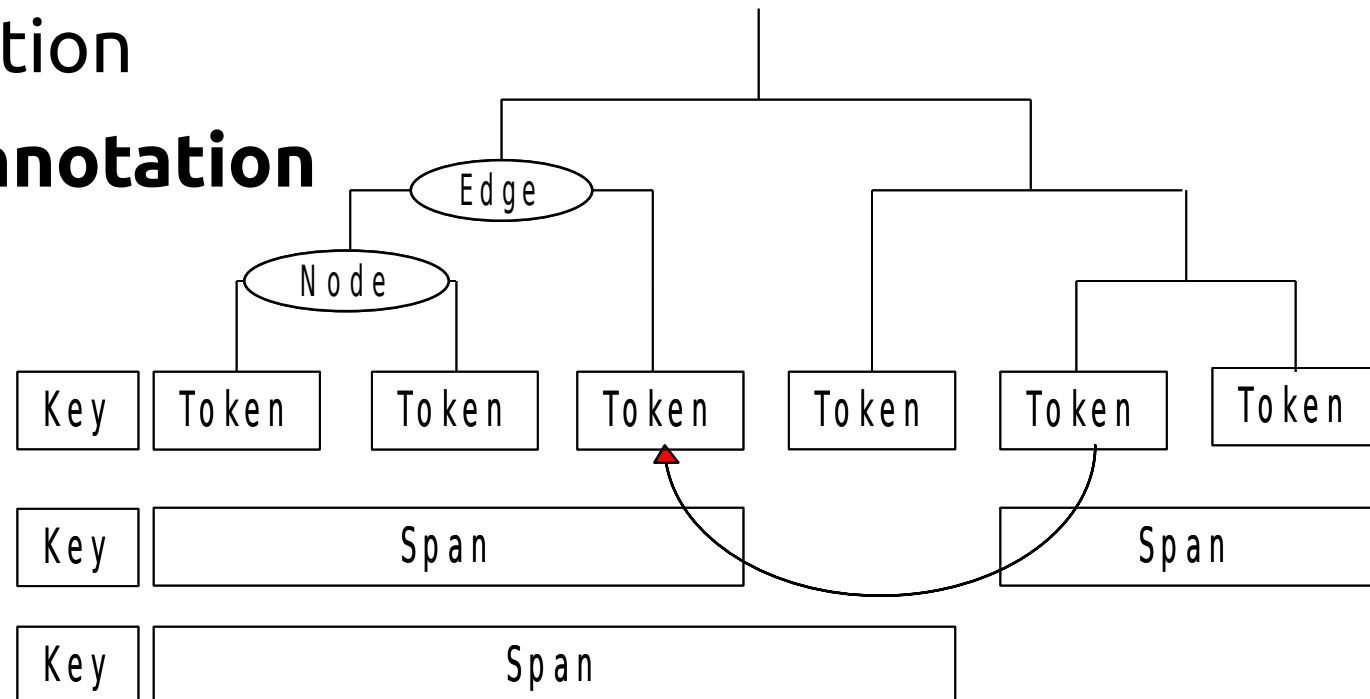
<https://www.ling.uni-potsdam.de/acl-lab/Forsch/pcc/pcc.html>

- Multiple annotations

- Different types of annotations
 - Token annotation
 - Span annotation
 - Pointing relation
 - Hierarchy annotation
(trees)



- Different types of annotations
 - **Token annotation**
 - **Span annotation**
 - Pointing relation
 - **Hierarchy annotation
(trees)**





- Token annotation
 - Exact sequence

searching for a word form

"Jugendlichen"

"jugendlichen"

- Token annotation
 - Exact sequence

searching for a word form

"Jugendlichen" 3 hits

"jugendlichen" 0 hits

→ tok="jugendlichen"

- Token annotation
 - Exact sequence

searching for an **exact** part of speech tag

pos	=	"NN"
-----	---	------

attribute value

- Attributes can have more than one value
- Searching for all values of an attribute



- Token annotation
 - Exact sequence

searching for an exact part of speech tag

`pos="NN"`

`pos="ADJA"`

- Token annotation
 - Exact sequence

searching for an exact part of speech tag

`pos="NN"` 62 hits

`pos="ADJA"` 18 hits

searching for all values of an attribute

`pos` 399 hits



- Span annotation
 - Exact sequence

searching for sentences

Sent="s"



- Span annotation
 - Exact sequence

searching for sentences

`Sent="s"` 28 hits



- **Sent="s"** 28 hits
 - necessary to know which annotations are in a corpus

Visible: All

Name	Texts	Tokens
pcc		
pcc2	2	399

Corpus information for pcc2 (ID: 5664)

Metadata		Available annotations	
Select corpus/document: pcc2		Node Annotations	
Name	Value	Name	Example (click to use query) URL
URL	link	exmaralda:Focu	exmaralda:Focus_newInf="nf-unsol"
annotation_description	POS, lemma, morphology, constituent and dependency syntax, information structure, coreference, rhetorical structure, article headings	exmaralda:head	exmaralda:heading="heading"
annotation_levels	pos;lemma;morph;Inf-Stat;Focus_newInf;PP;NP;Topic;Sent;Foc_c (for dominance egdes);dep:func (for dependency pointing relations);anaphor_antecedent (pointing relations)	exmaralda:Inf-S	exmaralda:Inf-Stat="giv-active"
full_name	Potsdam Commentary Corpus (sample of 2 documents)	exmaralda:NP	exmaralda:NP="NP"
language	German	exmaralda:PP	exmaralda:PP="PP"
source	Project D1, SFB 632	exmaralda:Sent	exmaralda:Sent="s"
version	6.0	exmaralda:Topic	exmaralda:Topic="ab"
		mmax:ambiguity	mmax:ambiguity="not_ambig"
		mmax:anaphor_	mmax:anaphor_type="anaphor_nomi
		mmax:complex_	mmax:complex_np="no"
		mmax:dir_speec	mmax:dir_speech="text_level"
		mmax:grammati	mmax:grammatical_role="other"
		mmax:np_form	mmax:np_form="defnp"
		mmax:phrase_t	mmax:phrase_type="np"
		mmax:referentie	mmax:referentiality="discourse-new"
		mmax:type	mmax:type="none"
		rst:kind	rst:kind="segment"
		Edge Annotations	
		Edge Types	
		Meta Annotations	

Link to corpus: https://korpling.german.hu-berlin.de/annis3/#_c=cGNjMg



- Token annotation
 - Patterns
 - matches any single character
 - * zero or more of the preceding element
- searching for the beginning a of word

```
/Jugend.*/
```

```
/jugend.*/
```

- Token annotation

- Patterns

- matches any single character

- * zero or more of the preceding element

searching for the beginning a of word

`/Jugend.*/`

5 hits ("Jugendlichen" 3 hits)

Jugendlichen Jugendliche

`/jugend.*/`

0 hits ("jugendlichen" 0 hits)



- Token annotation
 - patterns

searching for **all** nouns

`pos=/N./`

includes NN & NE

searching for **all** adjectives

`pos=/ADJ./`

includes ADJA & ADJD



- Token annotation
 - patterns

searching for **all** nouns

`pos=/N./`

73 hits (pos="NN" 62 hits)

searching for **all** adjectives

`pos=/ADJ./`

32 hits (pos="ADJA" 18 hits)

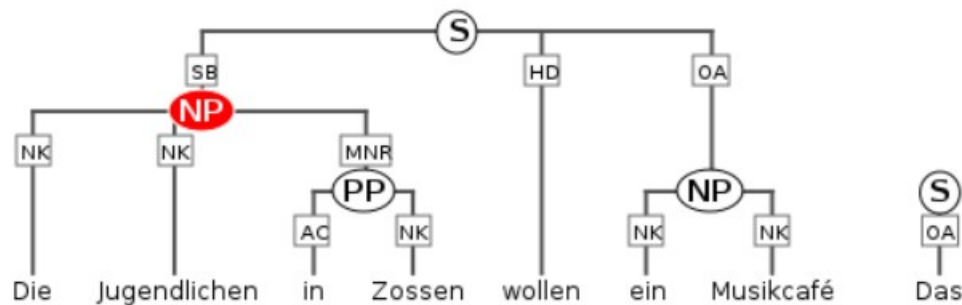
- Span annotation

searching for all NPs

`cat="NP"`

41 hits (pos="NN" 62 hits)

e.g. *Die Jugendlichen in Zossen*



- Relations between attributes

searching for all NPs which contain a preposition

`cat="NP"`

41 hits

`pos="APPR"`

19 hits

e.g. *Die Jugendlichen in Zossen*

→ no relation between the two information!

- Relations between attributes

searching for **all** NPs which contain a preposition

`cat="NP"`

#1

`pos="APPR"`

#2

e.g. *Die Jugendlichen in Zossen*

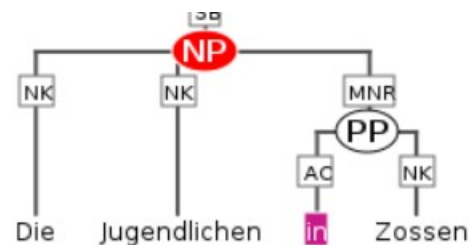
→ NP includes APPR

- Relations between attributes

searching for **all** NPs which contain a preposition

```
cat="NP" &
pos="APPR" &
#1_i_#2
```

e.g. *Die Jugendlichen in Zossen*

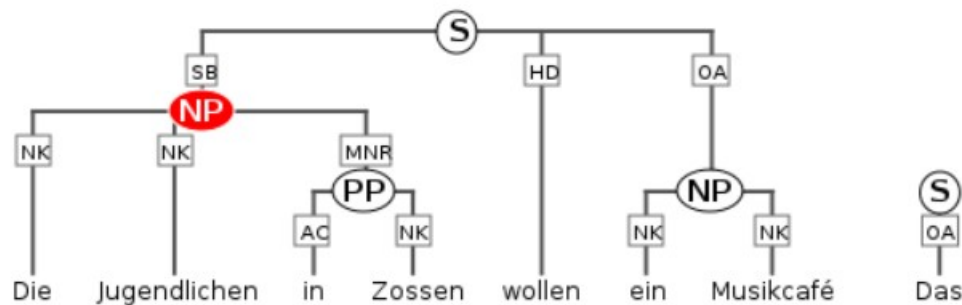


- Relations between attributes

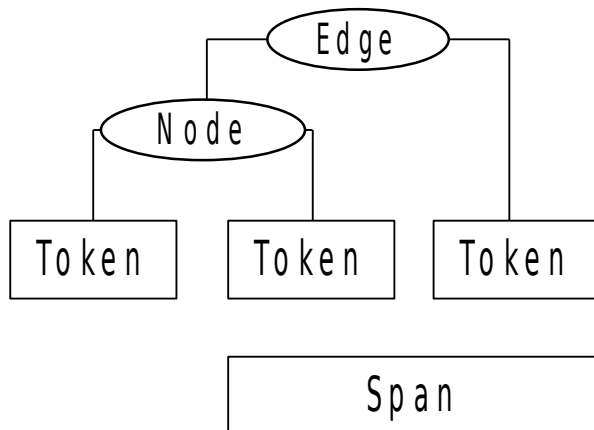
searching for **all** NPs which are **objects**

`cat="NP"`

e.g. *Die Jugendlichen in Zossen* -->subject!



- Relations between attributes
 - searching all **NPs** which are **objects**
 - **NP** → node annotation
 - **OA** → edge annotation



- Relations between attributes

searching all NPs which are objects

```
cat="NP"
```

the syntactic function in the tree

```
func="OA"
```

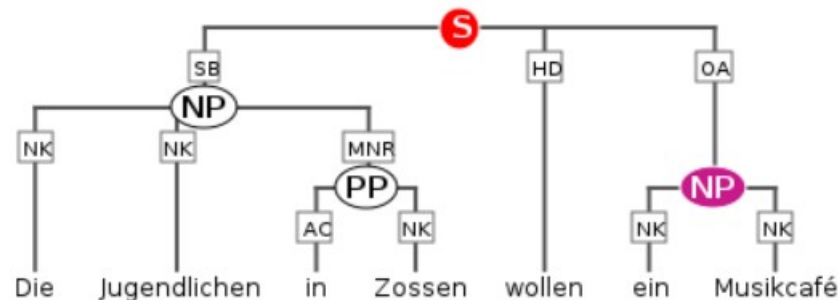
→ Note: At least there are two elements which relate in a way to each other!

- Relations between attributes

searching all NPs which are objects

`node & cat="NP" & #1 >[func="OA"] #2`

e.g. *ein Musikcafé* --> object!



- Relations we used:

A _i_ B

A includes B

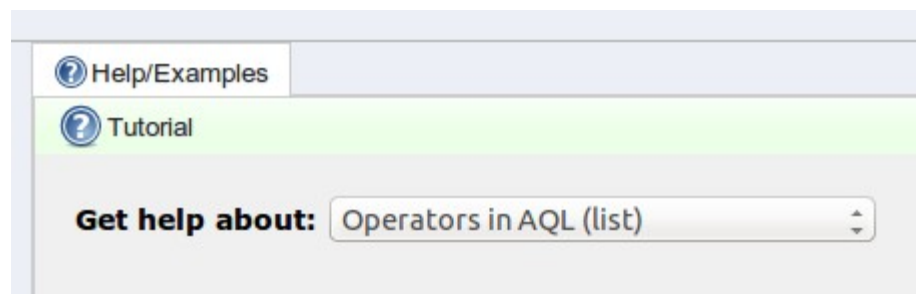
A > B

A dominates B

A >[func="OA"] B

A dominates B and B is an
object

The full list of relations can be found in ANNIS





ANNIS: Search and
Visualization in
Multilayer Linguistic
Corpora

What's new in
ANNIS

What's new in ANNIS

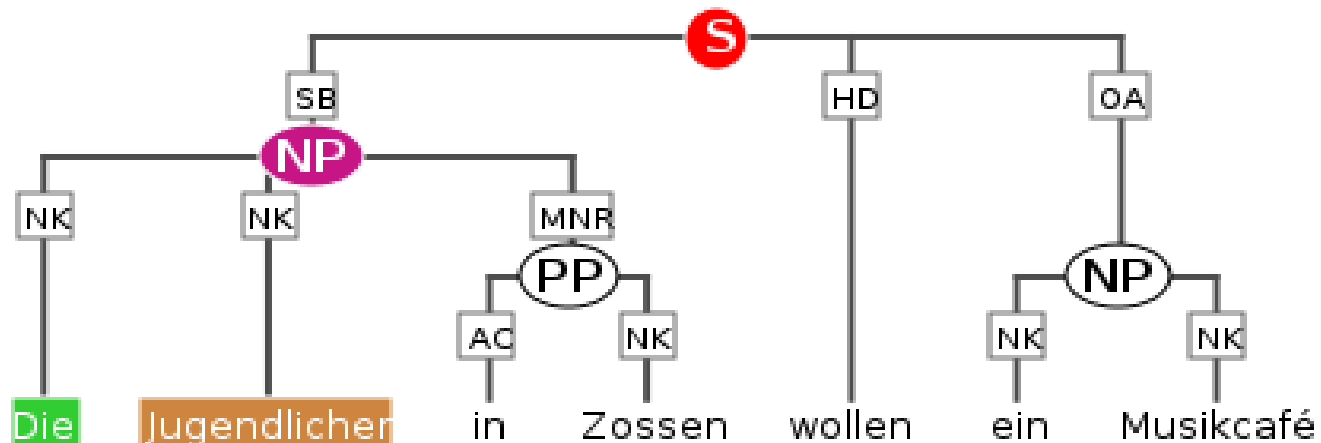
version 3.1.7



- Simplified syntax (AQL)
- Frequency analysis (Visualisierung)
- Expand match context (Visualisierung)
- Equality and Inequality (AQL)
- Variables (AQL)
- Complex OR expression (AQL)
- Document browser (Visualisierung)
- CSV export (Visualisierung)
- Tooltip for corpus names (Visualisierung)
- Report problem (Visualisierung)

- Question:

„Die“ followed by „Jugendlichen“ both being dominated by a prepositional phrase which is dominated by a sentence

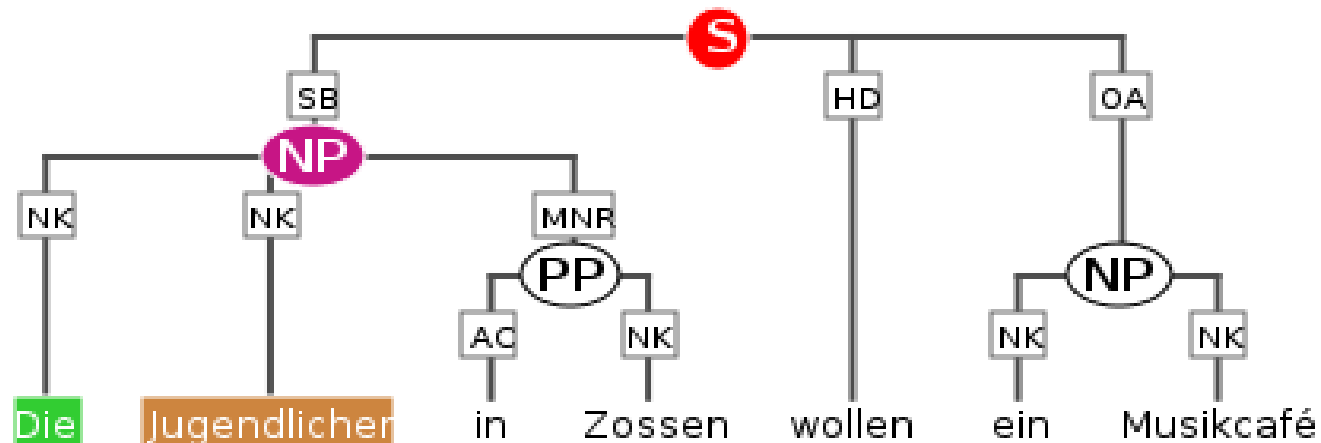


So far:

cat="S" & cat="NP" & "Die" & "Jugendlichen" & #1 > #2 & #2 > #3 & #2 > #4 & #3 . #4

- Question:

„Die“ followed by „Jugendlichen“ both being dominated by a prepositional phrase which is dominated by a sentence



So far:

cat="S" & cat="NP" & "Die" & "Jugendlichen" & #1 > #2 & #2 > #3 & #2 > #4 & #3 . #4

Simplified:

cat="S" > cat="NP" > "Die" . "Jugendlichen" & #2 > #4



- Question:
 - How many words tagged as „NN“, „ADJA“ or „ADV“ does a corpus contain?
 - What are the most frequent part-of-speech tags followed by a noun?
 - What are the most frequent part-of-speech tags in a prepositional phrase, which is in a sentence?
 - ...



pos

399 matches in 2 documents

Name	Texts	Tokens
pcc2	2	399
Potsdam_Commentary_	2	399

selected corpora: pcc2

query to analyze: pos

Node num	Selected annotation of	Comment
1	pos	automatically created from pos

Perform frequency analysis



pos

399 matches in 2 documents

Name	Texts	Tokens
pcc2	2	399
Potsdam_Commentary_	2	399

Frequency Analysis

linear scale (selected)
log₁₀ scale

POS	Count
NN	62
ADV	37
ART	36
\$.	28
\$.	19
APPR	19
ADJA	18
PRER	18
VVFIN	18

Download as CSV

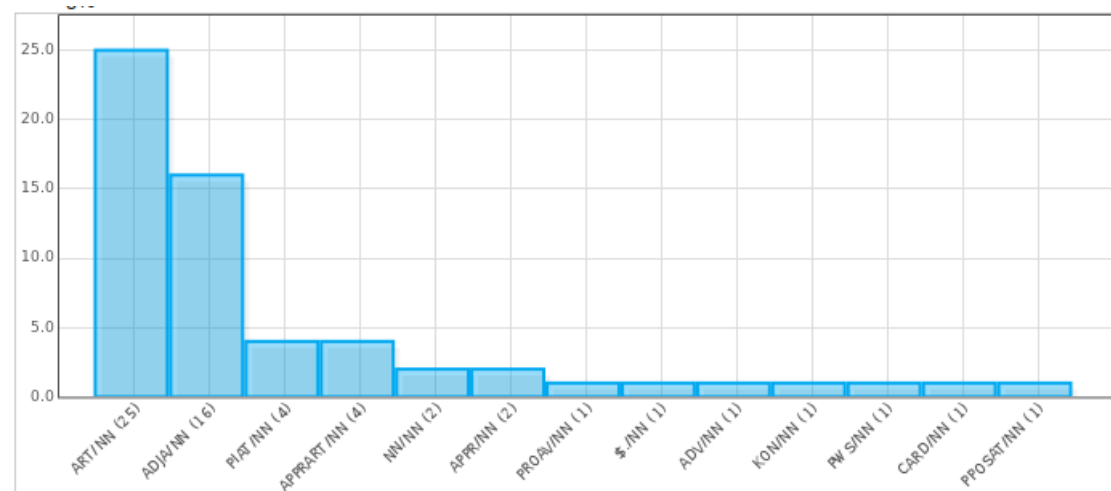


The screenshot shows the ANNIS interface with a search for 'pos'. The search results show 399 matches in 2 documents. A frequency analysis bar chart is displayed on the right, showing the distribution of results. The chart has a linear scale selected. The y-axis ranges from 0 to 60. The x-axis represents the frequency of results. The highest frequency is approximately 62, followed by a sharp drop to around 37, and then a gradual decline to about 18.

Attention:
A frequency analysis has to be bound to a query!

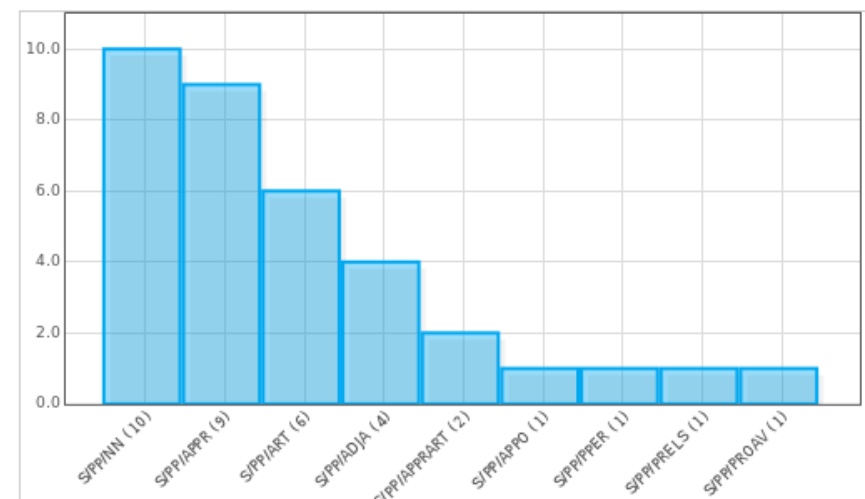
- What are the most frequent part-of-speech tags followed by a noun?

```
pos . pos="NN"
```

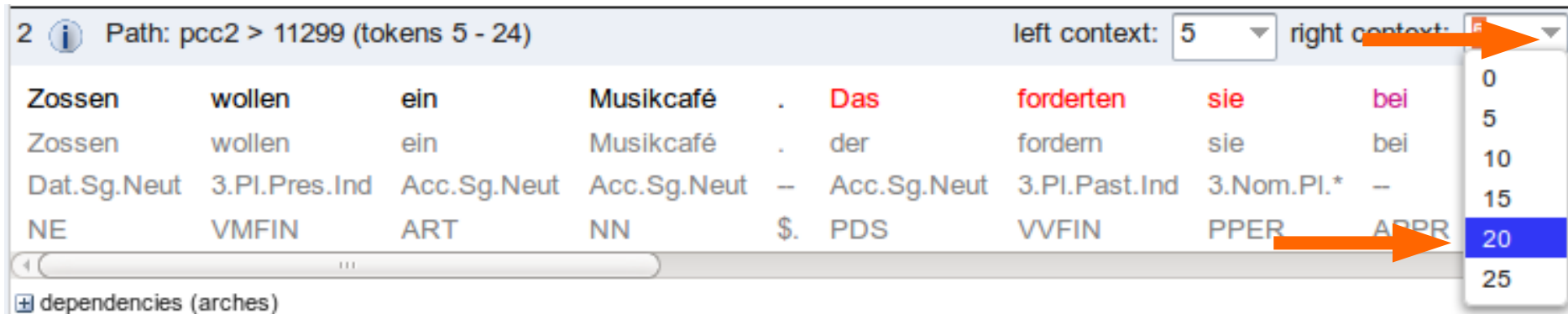


- What are the most frequent part-of-speech tags in a prepositional phrase, which is in a sentence?

```
cat="S" > cat="PP" > pos
```



- Sometimes the context is too small



2 Path: pcc2 > 11299 (tokens 5 - 24) left context: 5 right context: 5

Zossen	wollen	ein	Musikcafé	.	Das	forderten	sie	bei
Zossen	wollen	ein	Musikcafé	.	der	fordern	sie	bei
Dat.Sg.Neut	3.PI.Pres.Ind	Acc.Sg.Neut	Acc.Sg.Neut	–	Acc.Sg.Neut	3.PI.Past.Ind	3.Nom.PI.*	–
NE	VMFIN	ART	NN	\$.	PDS	VVFIN	PPER	APPR

dependencies (arches)

- Even more than 25 is possible, it's a free text field



- Equality „==“ and inequality „!=“ for attributes
- Question (equality):
two same part-of-speech tags, one directly following the other

ersten

Zossener

erster

Zossener

Pos.Dat.Sg.Fem

Pos.*.*

ADJA

ADJA

pos . pos & #1 == #2

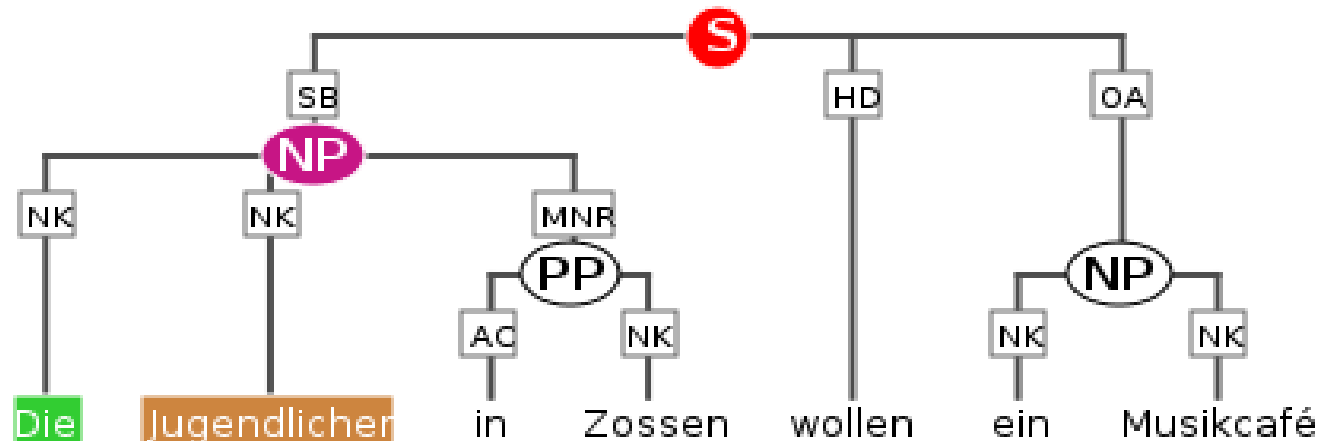
- Equality „==“ and inequality „!=“ for attributes
- Question (inequality):
two different part-of-speech tags, one directly following
the other

Die	Jugendlichen
der	jugendliche
Nom.Pl.*	Nom.Pl.*
ART	NN

pos . pos & #1 != #2

- Question:

„Die“ followed by „Jugendlichen“ both being dominated by a prepositional phrase which is dominated by a sentence

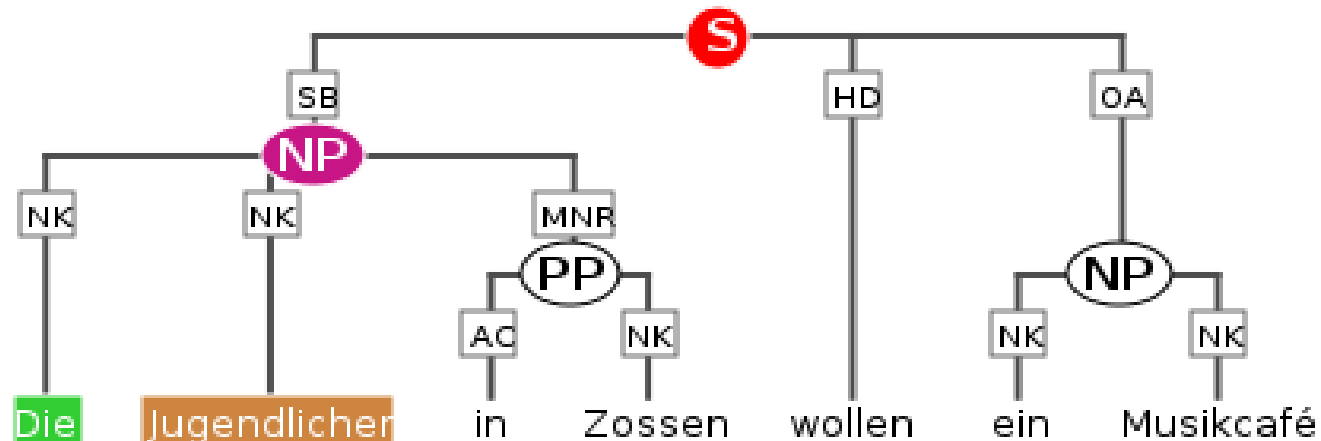


Simplified:

cat="S" > cat="NP" > "Die" . "Jugendlichen" & #2 > #4

- Question:

„Die“ followed by „Jugendlichen“ both being dominated by a prepositional phrase which is dominated by a sentence

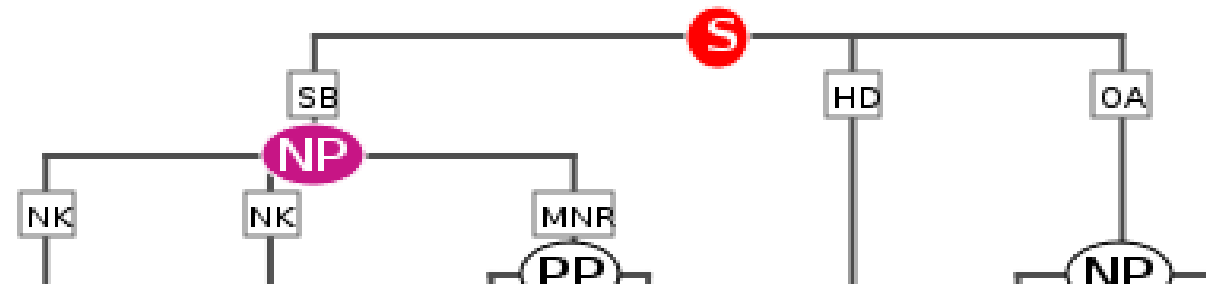


Simplified:

`cat="S" > np#cat="NP" > "Die" . jug#"Jugendlichen" & #np > #jug`

- Question:

„Die“ followed by „Jugendlichen“ both being dominated by a prepositional phrase which is dominated by a sentence



Variables and numbers can be mixed:

`cat="S" > np#cat="NP" > "Die" . "Jugendlichen" & #np > #4`

Simplified:

`cat="S" > np#cat="NP" > "Die" . jug#"Jugendlichen" & #np > #jug`



- Question (simple OR):

A part-of-speech tag which is a noun, an attributive adjective or an article

```
pos=/((NN)|(ADJA)|(ART)/           (in pattern search)
```



- Question (simple OR):

A part-of-speech tag which is a noun, an attributive adjective or an article

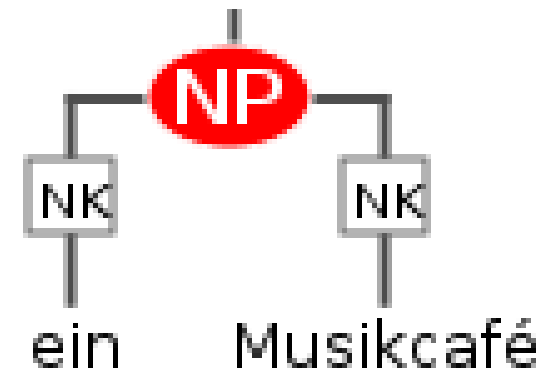
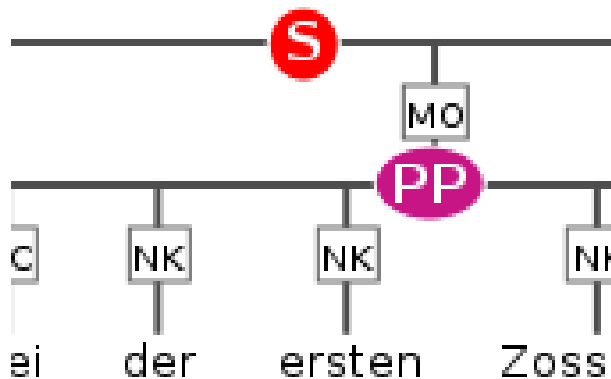
```
pos=/(NN)|(ADJA)|(ART)/      (in pattern search)
```

- OR for expressions

```
pos="NN" | pos="ADJA" | pos="ART"
```

- Question (complex OR):

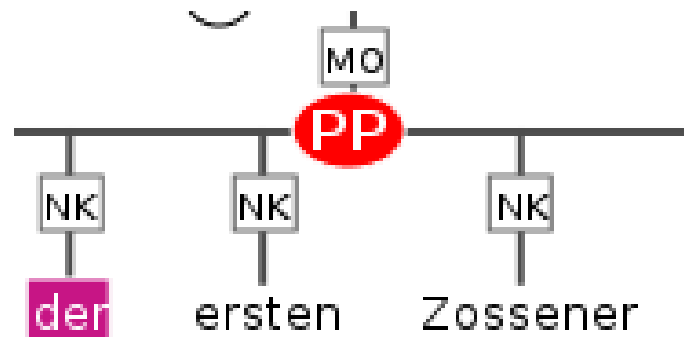
A prepositional phrase, which is dominated by a sentence, or just a nominal phrase



`(cat="S" > cat="PP") | cat="NP"`

- Question (nested OR):

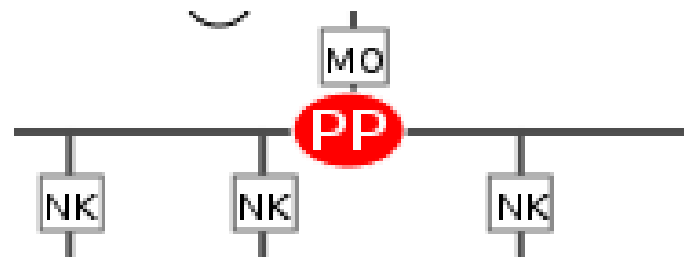
A prepositional phrase, which dominates a noun, an attributive adjective or an article



`a#cat="PP" &`
`(b#pos="NN" | b#pos="ADJA" | b#pos="ART") &`
`#a > #b`

- Question (nested OR):

A prepositional phrase, which dominates a noun, an attributive adjective or an article



Attention:

All expressions in brackets have to use the same variable

... & (b#pos="NN" | b#pos="ADJA" | b#pos="ART") & ...

a#cat="P

(b#pos="NN" | b#pos="ADJA" | b#pos="ART") &

#a > #b



- Displays the entire text of a document

The screenshot shows the ANNIS web interface. On the left, there is a search area with a text input field containing "Please enter AQL query", a "Query Builder" button, and a "Search" button. Below the search area, there is a "Status: Ok" message and a "Corpus List" section. The "Corpus List" section has a "Visible:" dropdown set to "All" and a "Filter" input field. Below the filter, there is a table with columns "Name", "Texts", and "Tokens". The table contains one row for "pcc2" with 2 texts and 399 tokens. An orange arrow points to the "pcc2" row in the "Corpus List" table.

On the right, there is a "Help us to make ANNIS better!" link and a "Help/Examples" button. Below these, there is a table with columns "document name", "corpus path", "visualizer", and "info". The table contains two rows:

document name	corpus path	visualizer	info
11299	pcc2 > 11299	full text	
4282	pcc2 > 4282	full text	

An orange arrow points to the "full text" link in the first row of the table.



ANNIS: Search and Visualization in Multilayer Linguistic Corpora

Document browser

Please enter AQL query

Query Builder

Search More ▾ History ▾

Status: Ok

Corpus List Search Options

Visible: All

Name	Texts	Tokens		
pcc2	2	399	i	☰

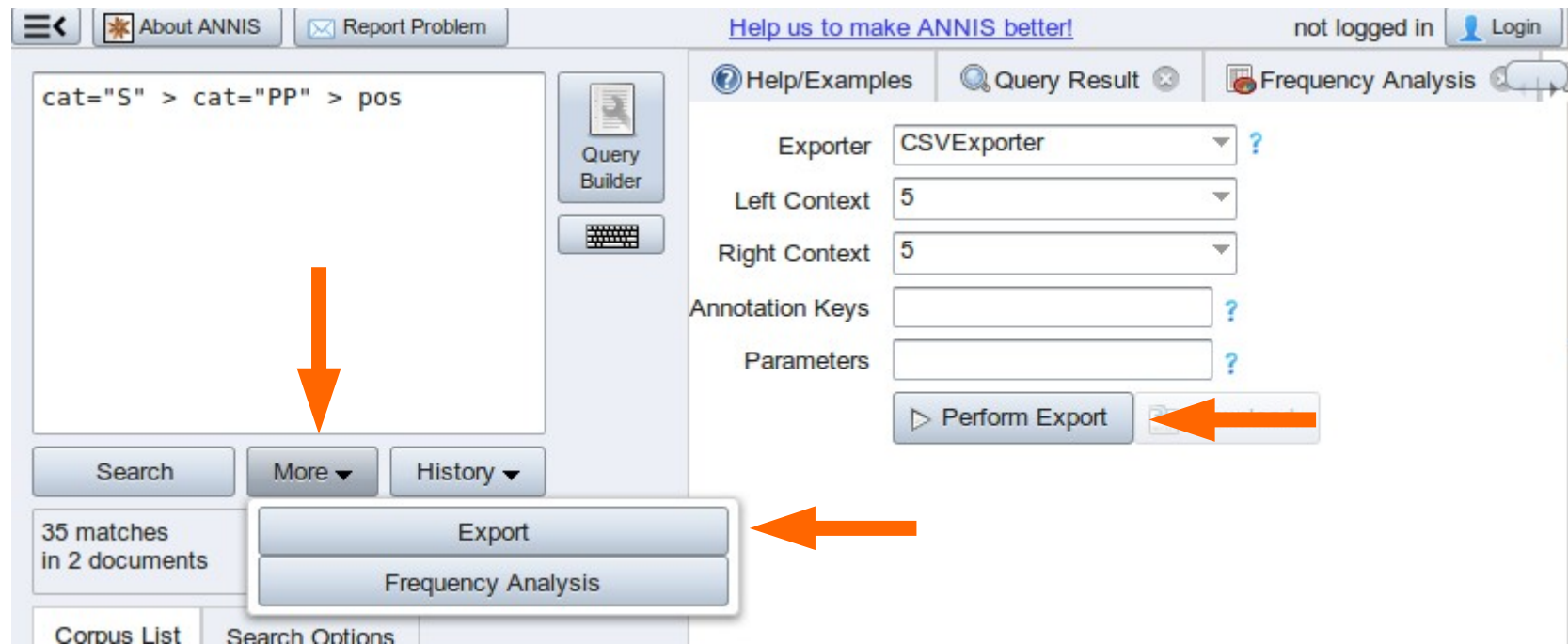
Help us to make ANNIS better!

Help/Examples pcc2 pcc2 > 11299 - ...

pcc2 > 11299 - Visualizer: full text

Feigenblatt Die Jugendlichen in Zossen wollen ein Musikcafé . Das forderten sie bei der ersten Zossener Runde am Dienstagabend . Dass die Politiker der Stadt dafür Verständnis haben , ist löblich . Mit dem Treffen im Rathaus ist somit auch ein Dialog zwischen den Generationen angestoßen . Dass die beiden geladenen Jugendlichen im Laufe des Abends immer weniger zu Wort kamen , war sicher keine böse Absicht , ärgerlich ist es trotzdem . Und aberwitzig dazu . Es entbehrt nicht der Komik , wenn sich drei Erwachsene - Karola Andrae (Bürgerbündnis/FDP) , Susanne Michler (CDU) und Joachim Zanow (SPD) - darüber streiten , was Jugendliche wollen und brauchen , ohne auf die Idee zu kommen , sie selbst zu fragen . Und das , obwohl sie ihnen gegenüber sitzen . Die Jugendlichen wurden somit zum bloßen Feigenblatt degradiert . Nicht über sondern mit ihnen hätten die Politiker reden sollen . Damit ist eine große Chance vertan . Vielleicht klappt es bei der nächsten Runde Anfang 2002 . Dann werden auch mehr Jugendliche eingeladen . In der Gruppe können sie sich hoffentlich mehr Gehör verschaffen . Vielleicht finden dann auch Vertreter von PDS und Gewerbeverein ihren Weg ins Rathaus . Die glänzten diesmal noch mit Abwesenheit .


- Export data for further processing







The screenshot shows the ANNIS interface with the search query `cat="S" > cat="PP" > pos`. The search results show 35 matches in 2 documents. The 'More' dropdown menu is open, showing 'Export' and 'Frequency Analysis' options. The 'Perform Export' button is highlighted with an orange arrow. The 'Export' button in the dropdown is also highlighted with an orange arrow. The 'Perform Export' button has a small icon of a document with a download arrow.

- Sometimes corpus names can get very long

Corpus List Search Options

Visible: All 

Filter

Name ▲	Texts	Tokens		
pcc2	2	399		
Potsdam_Commenta	2	399		

Potsdam_Commentary_Corpus



- ANNIS comes in two flavors
 - A server version
 - A desktop version (ANNIS kickstarter)
 - Both are downloadable at:
<http://www.sfb632.uni-potsdam.de/annis/>
- ANNIS is open source (Apache license 2.0) and hosted on github
 - <https://github.com/korpling/ANNIS>



Thanks for your attention!
Any questions?

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