

COR: Corpus Linguistics

Lecture 12

Review of Corpus Linguistics

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<https://github.com/bond-lab/Corpus-Linguistics>

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Overview

- Markup and Annotation
- Using Corpora: Regular Expressions
- Multimodal and Multilingual Corpora
- Collocation, Frequency, Corpus Statistics
- DIY Corpora, Corpus Tools, Processing Raw Text
- Case studies: Lexical, Grammatical, Contrastive, Diachronic
- Corpora and Language Engineering
- Representativeness and Balance
- Copyright and Licensing

More SQL

Creating; Inserting; Updating and Deleting

How to create a Table

```
CREATE TABLE database_name.table_name(  
    column1 datatype PRIMARY KEY(one or more columns),  
    column2 datatype,  
    column3 datatype,  
    .....  
    columnN datatype,  
);
```

Each column should have a **datatype**

TEXT	A text string, stored using the database encoding
INTEGER	Signed integer (or INT)
REAL	Floating point number
CHAR(N)	String of N characters padded with spaces
VARCHAR(N)	String of N characters

sqlite is very forgiving, you can store any data type in any column.

For example: thw word table

```
CREATE TABLE word (  
-- store words, with POS and lemma  
-- start and end in the corresponding sentence (cfrom, cto)  
    sid INTEGER,      -- sentence ID  
    wid INTEGER,      -- wid (should be consecutive)  
    word TEXT,        -- surface form of the word  
    pos TEXT,         -- part of speech  
    lemma TEXT,       -- lemma (true-cased)  
    cfrom INTEGER,    -- start position  
    cto INTEGER,      -- end position  
    comment TEXT,  
    PRIMARY KEY (sid, wid),  
    FOREIGN KEY(sid) REFERENCES sent(sid)  
);
```

PRIMARY KEYS

- The PRIMARY KEY constraint uniquely identifies each record in a database table.
- Primary keys must contain UNIQUE values.
- A primary key column cannot contain NULL values.
- Each table can have only ONE primary key.
- Most tables should have a primary key

You can show it with .tables or .schema

```
sqlite>.tables  
sent word concept ...
```

```
sqlite>.schema word  
CREATE TABLE word (  
  sid INTEGER,  
  wid INTEGER,  
  word TEXT,  
  pos TEXT,  
  lemma TEXT,  
  cfrom INTEGER,  
  cto INTEGER,  
  comment TEXT,  
      PRIMARY KEY (sid, wid),  
      FOREIGN KEY(sid) REFERENCES sent(sid) );
```

Inserting Information

```
INSERT INTO word (sid, wid, word, pos, lemma)
VALUES (1, 0, "The", "DT", "the");
INSERT INTO word (sid, wid, word, pos, lemma)
VALUES (1, 1, "Adventure", "NNS", "ADVENTURE");
INSERT INTO word (sid, wid, word, pos, lemma)
VALUES (1, 2, "of", "PP", "of");
```


Upating Information

```
UPDATE word SET lemma='adventure'  
WHERE sid=1 AND wid=1;
```

or

```
UPDATE word SET lemma='adventure'  
WHERE lemma='ADVENTURE';
```

Everything that matches the condition gets updated

Best to check with a SELECT first:

```
SELECT * FROM word  
WHERE lemma='ADVENTURE';
```

Deleting Information

Be very, very careful:

```
DELETE FROM table_name  
WHERE [condition];
```

Dates and times

Time String	Example
YYYY-MM-DD	2010-12-30
YYYY-MM-DD HH:MM	2010-12-30 12:10
YYYY-MM-DD HH:MM:SS.SSS	2010-12-30 12:10:04.100
MM-DD-YYYY HH:MM	30-12-2010 12:10
HH:MM	12:10
YYYY-MM-DDTHH:MM	2010-12-30 12:10
HH:MM:SS	12:10:01
now	2015-04-15

```
sqlite> SELECT date('now');
```

```
2015-04-15
```

```
sqlite> SELECT date('now', '+1 months');
```

```
2015-05-15
```

```
sqlite> SELECT date('now', 'start of month');
```

```
2015-05-01
```

Task

- Create a new table in your database
- Add three entries
- Update two
- Delete one

Make a bigram Table

```
create TABLE bigram (sid INT, wid INT, bigram TEXT);
```

```
INSERT INTO bigram (sid, wid, bigram)
  SELECT a.sid, a.wid, a.lemma || ' ' || b.lemma
  FROM word AS a JOIN word AS b
  ON a.sid=b.sid AND a.wid = b.wid-1
  LIMIT 5;
```

The result:

```
sqlite> SELECT sid, wid, bigram FROM bigram;
60000 0 prime minister_tomiichi_murayama
60000 1 minister_tomiichi_murayama on
60000 2 on the
60000 3 the 28
60000 4 28 hold
```

Trading SPACE for TIME

- Storing bigrams makes the DB bigger
- But you can manipulate them quickly
- For large tables, you can also **INDEX** them

```
CREATE INDEX word_idx  
on word (lemma, pos);
```

- This allows you to query word or word+pos much faster
- Use indexes for big tables you search often but don't update much
- Indexes can double the size of your database
 - But speed big searches up from hours to seconds

Batch Import

- You can input well formatted data using `sqliteman` or similar
 - define the column separator ':' or '|' or TAB or ',' or ...
 - or load from spreadsheet
- Or through some program
 - Learn more in HG2051 *Language and the Computer*

Revision

The goal of this course

Master the uses of text corpora
in linguistics research and applications.

- Selecting text
- Marking up extra information
- The range of existing corpora
- How to build your own corpus
- Using corpora to test linguistic hypotheses
- Using corpora to train language tools

What did you learn?

You should be able to:

- Understand the uses of text corpora in language research
Be able to manipulate them with simple tools
- Use a concordance program to extract data from a corpus
- Design and build a corpus for some task
 - considering representativeness, balance and legal issues
 - as well as usability and accuracy
- Understand how to analyse corpus data through basic statistical methods
- Understand the issues involved in using data for NLP

Reflection

- What was the most surprising thing in this class?
- What do you think is most likely wrong?
- What do you think is the coolest result/corpus?
- What do you think you're most likely to remember?
- How do you think this course will influence you as a linguist/specialist?
- What (if anything) did you hope to learn that you didn't?