

IBM DB2 at UW

(a mini-tutorial)

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DB2: what is it?

DB2 is a relational DBMS and a set of tools:

- a command-line interface to SQL, and
- an ESQL preprocessor for C language.

This tutorial covers (briefly):

- how to run DB2,
- useful hints, and
- what to do if something goes wrong.

DB2 documentation: online at

https://www.ibm.com/support/knowledgecenter/SSEPGG_10.1.0/com.ibm.db2.luw.kc.doc/welcome.html

First Steps

- DB2 is available on
`linux.student.cs.uwaterloo.ca`
- Your environment should be set up correctly:

`sh, bash, et al:`

```
$ source ~db2inst2/sqlllib/db2profile
```

`csh, tcsh, et al:`

```
$ source ~db2inst2/sqlllib/db2cshrc
```

- You don't need any DB2 password.

Every CS338 student should have an account on `linux.student.cs`

First Steps (example)

```
softbase.cs$ ssh linux.student.cs.uwaterloo.ca
[...]  
$ source ~db2inst2/sqllib/db2profile  
$ db2 -t  
(c) Copyright IBM Corporation 1993,2007  
Command Line Processor for DB2 Client 11.5.5.0  
  
[...]  
  
For more detailed help, refer to the Online Reference Manual.  
  
db2 =>
```

Connecting to a Database

```
db2 => connect to cs348;
```

Database Connection Information

```
Database server          = DB2/LINUX8664 11.5.5.0  
SQL authorization ID     = DAVID  
Local database alias     = CS348
```

```
db2 =>
```

cs348 is the name of a database managed by DB2 for this class

Executing Queries

SQL statements can be entered directly at the db2 => prompt.

```
db2 => select aid,name  
db2 (cont.) => from david.author;
```

AID	NAME
1	Toman, David
2	Chomicki, Jan
3	Saake, Gunter

3 record(s) selected.

Ending commands/statements with ; allows entering long queries.
Needs using DB2 tieh the -t option.

What tables are there?

```
db2 => list tables;
```

Table/View	Schema	Type	Creation time
ARTICLE	DAVID	T	2021-05-08-15.53.39
AUTHOR	DAVID	T	2021-05-08-15.53.36
BOOK	DAVID	T	2021-05-08-15.53.37
JOURNAL	DAVID	T	2021-05-08-15.53.38
PROCEEDINGS	DAVID	T	2021-05-08-15.53.38
PUBLICATION	DAVID	T	2021-05-08-15.53.36
WROTE	DAVID	T	2021-05-08-15.53.37

```
  7 record(s) selected.
```

Is that all?

```
db2 => list tables for all;
```

Table/View	Schema	Type	Creation time
ARTICLE	DAVID	T	2021-05-08-15.53.39
AUTHOR	DAVID	T	2021-05-08-15.53.36
COLCHECKS	SYSCAT	V	2019-09-10-10.55.30
...			
SYSTABLES	SYSIBM	T	2019-09-10-10.55.12
...			
SYSVIEWS	SYSIBM	T	2019-09-10-10.55.12
COLDIST	SYSSTAT	V	2019-09-10-10.55.39
COLUMNS	SYSSTAT	V	2019-09-10-10.55.39
FUNCTIONS	SYSSTAT	V	2019-09-10-10.55.39
INDEXES	SYSSTAT	V	2019-09-10-10.55.40
TABLES	SYSSTAT	V	2019-09-10-10.55.40

```
146 record(s) selected.
```

HELP (built in)

db2 => ?

ACTIVATE DATABASE	ECHO	PREP/PRECOMPILE
ADD DATALINKS MANAGER	EXPORT	PRUNE HISTORY/LOGFILE
ADD NODE	FORCE APPLICATION	QUERY CLIENT
ATTACH	GET/RESET/UPDATE ADMIN CFG	QUIESCE TABLESPACES
ATTACH TO	GET AUTHORIZATIONS	QUIT
BACKUP DATABASE	GET CONNECTION STATE	REBIND
BIND	GET INSTANCE	RECONCILE
CATALOG APPC NODE	GET MONITOR SWITCHES	REDISTRIBUTE NODEGROUP
CATALOG APPCLU NODE	GET SNAPSHOT	REFRESH LDAP
CATALOG APPN NODE	GET/RESET/UPDATE CLI CFG	REGISTER
CATALOG DATABASE	GET/RESET/UPDATE DB CFG	RELEASE
CATALOG DCS DATABASE	GET/RESET/UPDATE DBM CFG	REORG TABLE
CATALOG GLOBAL DATABASE	HELP	REORGCHK
CATALOG IPXSPX NODE	IMPORT	RESET MONITOR
CATALOG LDAP DATABASE	INITIALIZE TAPE	RESTART DATABASE
CATALOG LDAP NODE	INVOKE	RESTORE DATABASE

[...]

Note: Some commands are operating system specific and may not be available.

For further help: ? db2-command - help for specified command
 ? OPTIONS - help for all command options
 ? HELP - help for reading help screens

The preceding three options can be run as DB2 <option> from an OS prompt.

Scary, but **very comprehensive** help system.

More HELP

What do these funny error codes (e.g., DB21034E) mean?

```
db2 => blah blah;
```

```
DB21034E  The command was processed as an SQL statement  
because it was not a valid Command Line Processor command.  
During SQL processing it returned: SQL0104N  An unexpected  
token "blah" was found following "BEGIN-OF-STATEMENT".  
Expected tokens may include: "<values>".  SQLSTATE=42601
```

```
db2 => ? DB21034E
```

```
DB21034E  The command was processed as an SQL statement  
because it was not a valid Command Line Processor  
command.  During SQL processing it returned:
```

Explanation: This message is displayed before the SQL error message. The error may be caused by a syntax error in a non-SQL command.

User Response: Correct the error and resubmit the command.

Command Line Usage

Syntax: db2 <command>

```
$ db2 list tables
```

Table/View	Schema	Type	Creation time
ARTICLE	DAVID	T	2021-05-08-15.53.39
AUTHOR	DAVID	T	2021-05-08-15.53.36
BOOK	DAVID	T	2021-05-08-15.53.37
JOURNAL	DAVID	T	2021-05-08-15.53.38
PROCEEDINGS	DAVID	T	2021-05-08-15.53.38
PUBLICATION	DAVID	T	2021-05-08-15.53.36
WROTE	DAVID	T	2021-05-08-15.53.37

```
7 record(s) selected.
```

Special characters (e.g., *) need to be quoted.

Scripts

To run code from a file `batch.file` use:

```
$ db2 -tvf batch.file
```

```
<DB2 messages here; input is echoed (-v)>
```

Sample SQL DDL and DML for in class examples can be downloaded from the course web page:

⇒ `sampleDB.db2`

⇒ `samples $n$ .db2`

Problems

Look if DB2 is running (this is how a healthy DB2 looks like):

```
$ ps -ef | grep db2
db2inst2  4896      1 0 May18 ?          00:00:03 /lib/systemd/...
db2inst2  4897    4896 0 May18 ?          00:00:00 (sd-pam)
root      5110      1 0 May18 ?          00:00:00 db2wdog
db2inst2  5112    5110 0 May18 ?          00:02:51 db2sysc
root      5118    5110 0 May18 ?          00:00:00 db2ckpwd
root      5119    5110 0 May18 ?          00:00:00 db2ckpwd
root      5120    5110 0 May18 ?          00:00:00 db2ckpwd
db2inst2  5122    5110 0 May18 ?          00:00:00 db2vend (PD ...
db2inst2  5131    5110 0 May18 ?          00:00:26 db2acd  ,0,...
db2fenc2 14139    5110 0 May18 ?          00:00:00 db2fmp ( ,1,...
david     23997      1 0 15:06 pts/12 00:00:00 /home/db2inst2/...
david     26239  22796 0 15:09 pts/12 00:00:00 grep db2
```

Email TAs or instructors if you can't access DB2.