MySQL Shell: The Best DBA tool?

How to Use the MySQL Shell as a Framework for DBAs

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about me - http://about.me/lefred

Who am I?
Frédéric Descamps

- @lefred
- MySQL Evangelist
- Hacking MySQL since 3.23
- devops believer
- living in Belgium 🇧🇪
- http://lefred.be
a new tool

MySQL Shell
MySQL Shell

The MySQL Shell is an interactive Javascript, Python, or SQL interface supporting development and administration for the MySQL Server and is a component of the MySQL Server. You can use the MySQL Shell to perform data queries and updates as well as various administration operations.
MySQL Shell (2)

The MySQL Shell provides:
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The MySQL Shell provides:

- Both Interactive and Batch operations
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- Both Interactive and Batch operations
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- Traditional Table, JSON, Tab Separated output results formats
- \textbf{MySQL} Standard and X Protocols
MySQL Shell (2)

The MySQL Shell provides:

- Both Interactive and Batch operations
- Document and Relational Models
- CRUD Document and Relational APIs via scripting
- Traditional Table, JSON, Tab Separated output results formats
- MySQL Standard and X Protocols
- and more...
MySQL Shell and Python

When using the python mode in the Shell, it's possible to use system modules (local).

```
[fred@imac2 workspace] $ mysqlsh
MySQL Shell 8.0.13

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Type '\help' or '\?' for help; '\quit' to exit.

MySQL   JS   \py
Switching to Python mode...

MySQL   Py   from datetime import datetime
MySQL   Py   datetime.now()
MySQL   Py   datetime.datetime(2018, 12, 16, 19, 54, 28, 222011)
```
MySQL Shell and Python (2)

Of course this can be any type of modules:

```python
from isbn.tools.app import *

doc=meta('9781260135442')

doc

{
    "Authors": ["David Stokes"],
    "ISBN-13": "9781260135442",
    "Language": "en",
    "Publisher": "McGraw-Hill Education",
    "Title": "MySQL And JSON: A Practical Programming Guide",
    "Year": "2018"

}
MySQL Shell and Python (2)

Of course this can be any type of modules:

```python
from isbn tools.app import *
doc = meta('9781260135442')
doc
```

```json
{
    "Authors": [
        "David Stokes"
    ],
    "ISBN-13": "9781260135442",
    "Language": "en",
    "Publisher": "McGraw-Hill Education",
    "Title": "MySQL And JSON: A Practical Programming Guide",
    "Year": "2018"
}
```
we want more!

Extending MySQL Shell
Extending MySQL Shell

Since 8.0.16, you have two different ways to extend the MySQL Shell:

- using the new Reporting Framework (>= 8.0.16)
- create your own modules to extend MySQL Shell
**MySQL Shell User-Defined Reports**

You can create reports that can be called ( ) one time or constantly refreshed ( ).

Example for checking the :
MySQL Shell User-Defined Reports (2)

This is a Python file ( ) installed in :

It contains a definition and a registration:
MySQL Shell User-Defined Reports (3)

More info:


Sources of Examples:

- [https://github.com/lefred/mysql-shell-udr](https://github.com/lefred/mysql-shell-udr)
- Pull Requests welcome!
Create your own modules for MySQL Shell

For calling some long statements or group of operations or sometimes to replace a missing functionality.
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Recently, somebody pointed out that since the new DD it was not anymore possible to delete all routines for a specific schema.
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Recently, somebody pointed out that since the new DD it was not anymore possible to delete all routines for a specific schema.

Jesper explained recently how the MySQL Shell could help here see https://mysql.wisborg.dk/2018/12/02/mysql-8-drop-several-stored-events-procedures-or-functions/
Extending MySQL Shell

```
FUNCTION `sys`.`extract_schema_from_file_name`
FUNCTION `sys`.`extract_table_from_file_name`
FUNCTION `sys`.`format_bytes`
FUNCTION `sys`.`format_path`
FUNCTION `sys`.`format_statement`
FUNCTION `sys`.`format_time`
FUNCTION `sys`.`list_add`
FUNCTION `sys`.`list_drop`
FUNCTION `sys`.`ps_is_account_enabled`
FUNCTION `sys`.`ps_is_consumer_enabled`
FUNCTION `sys`.`ps_is_instrument_default_enabled`
FUNCTION `sys`.`ps_is_instrument_default_timed`
FUNCTION `sys`.`ps_is_thread_instrumented`
FUNCTION `sys`.`ps_thread_account`
FUNCTION `sys`.`ps_thread_id`
FUNCTION `sys`.`ps_thread_stack`
FUNCTION `sys`.`ps_thread_trx_info`
FUNCTION `sys`.`quote_identifier`
FUNCTION `sys`.`sys_get_config`
FUNCTION `sys`.`version_major`
FUNCTION `sys`.`version_minor`
FUNCTION `sys`.`version_patch`
Total: 22
```
Extending MySQL Shell

[fred@imac2 functions] $ mysqlsh --python root@127.0.0.1
Creating a session to 'root@127.0.0.1'
Fetching schema names for autocompletion... Press ^C to stop.
Your MySQL connection id is 184 (X protocol)
Server version: 8.0.13 MySQL Community Server - GPL
No default schema selected; type \use <schema> to set one.
MySQL Shell 8.0.13

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Type '\help' or '\?' for help; '\quit' to exit.

MySQL [127.0.0.1:33060+ Py] mydba.getProcedures('test')
PROCEDURE 'test'.'helloworld'
Total: 1

MySQL [127.0.0.1:33060+ Py] mydba.deleteProcedures('test')
DROP PROCEDURE 'test'.'helloworld'
Total dropped: 1
Extending **MySQL Shell**

Or for example, retrieve the expiration period of passwords (see [https://lefred.be/content/mysql-when-will-the-password-of-my-users-expire/](https://lefred.be/content/mysql-when-will-the-password-of-my-users-expire/)):
Extending **MySQL Shell**

Another example, retrieve the tables potentially fragmented (see [https://lefred.be/content/overview-of-fragmented-mysql-innodb-tables/](https://lefred.be/content/overview-of-fragmented-mysql-innodb-tables/)):

```
<table>
<thead>
<tr>
<th>Table</th>
<th>Engine</th>
<th># Rows</th>
<th>Data Size</th>
<th>Idx Size</th>
<th>Total Size</th>
<th>Data Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>sbtest.sbtst1</td>
<td>InnoDB</td>
<td>1.54M</td>
<td>0.38G</td>
<td>0.03G</td>
<td>0.41G</td>
<td>48.00MB (11.54%)</td>
</tr>
</tbody>
</table>
```
Extending **MySQL Shell**

Recently somebody complained about the complexity of knowing what are the default values of columns when expressions are used ([https://forums.mysql.com/read.php?101,670682,670682](https://forums.mysql.com/read.php?101,670682,670682)):

```
 columns
<table>
<thead>
<tr>
<th>ColumnName</th>
<th>Type</th>
<th>Default</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>bi_col_exp</td>
<td>bigint</td>
<td>(8 * 8)</td>
<td>64</td>
</tr>
<tr>
<td>d_col</td>
<td>date</td>
<td>curdate()</td>
<td>2018-12-27</td>
</tr>
<tr>
<td>d_col_exp</td>
<td>date</td>
<td>(curdate() + 8)</td>
<td>2018-12-27</td>
</tr>
<tr>
<td>dt_col</td>
<td>datetime</td>
<td>CURRENT_TIMESTAMP</td>
<td>2018-12-27 09:53:11</td>
</tr>
<tr>
<td>enum_col</td>
<td>enum</td>
<td>value1</td>
<td>value1</td>
</tr>
<tr>
<td>int_col</td>
<td>int</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>t_col</td>
<td>time</td>
<td>curtime()</td>
<td>09:53:11</td>
</tr>
<tr>
<td>vc_col</td>
<td>varchar</td>
<td>test</td>
<td>test</td>
</tr>
<tr>
<td>vc_col_exp</td>
<td>varchar</td>
<td>concat(utf8mb4'test', utf8mb4'test')</td>
<td>testtest</td>
</tr>
</tbody>
</table>
```

Total: 9
Contribute to **MySQL Shell** DBA Toolkit?

Get the code from [https://github.com/lefred/mysql-shell-mydba](https://github.com/lefred/mysql-shell-mydba) and Pull Requests are welcome!
we want even more!
As maintainer of **Innotop**, after doing so delayed maintenance, I started a poll on Twitter:

```
lefred @lefred · Nov 12
Are you using **Innotop** for **MySQL**?

48% Yes
29% No
23% In the past, not anymore
```
Innotop (2)

So Innotop is not dead... but it's very complex to maintain... Perl!
Innotop (2)

So Innotop is not dead... but it's very complex to maintain... Perl!

This is maybe the reason there is less and less contributors...
Innotop (2)

So Innotop is not dead... but it's very complex to maintain... Perl!

This is maybe the reason there is less and less contributors...

... so and MySQL Shell then?
Innotop in MySQL Shell

```
## MySQL Shell | MySQL Community Server - GPL 8.0.13

<table>
<thead>
<tr>
<th>Cmd</th>
<th>Thd</th>
<th>Conn</th>
<th>Pid</th>
<th>State</th>
<th>User</th>
<th>Db</th>
<th>Time</th>
<th>Lock Time</th>
<th>Query</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
<td>47</td>
<td>9 9297</td>
<td>User sleep</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>13.37 s</td>
<td>0 ps</td>
<td>select sleep(120)</td>
<td></td>
</tr>
<tr>
<td>Query</td>
<td>171</td>
<td>143</td>
<td>None</td>
<td>Creating sort index mysqlx/worker</td>
<td>sys</td>
<td>41.15 ms</td>
<td>392.00 us</td>
<td>select <code>sys</code>.PROCESSTLIST_COM</td>
<td></td>
</tr>
<tr>
<td>Execute</td>
<td>181</td>
<td>142</td>
<td>17461</td>
<td>Sending data</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>2.64 ms</td>
<td>12.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>175</td>
<td>136</td>
<td>17461</td>
<td>Sending data</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>2.25 ms</td>
<td>12.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>176</td>
<td>137</td>
<td>17461</td>
<td>statistics</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>2.14 ms</td>
<td>23.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>174</td>
<td>135</td>
<td>17461</td>
<td>init</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>2.03 ms</td>
<td>0 ps</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>178</td>
<td>140</td>
<td>17461</td>
<td>statistics</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>2.03 ms</td>
<td>18.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>173</td>
<td>134</td>
<td>17461</td>
<td>statistics</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>1.86 ms</td>
<td>17.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>180</td>
<td>141</td>
<td>17461</td>
<td>Sending data</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>1.70 ms</td>
<td>14.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
<tr>
<td>Execute</td>
<td>177</td>
<td>138</td>
<td>17461</td>
<td>statistics</td>
<td>root@localhost</td>
<td>sbtest</td>
<td>1.68 ms</td>
<td>17.00 us</td>
<td>SELECT count(k) FROM ..</td>
</tr>
</tbody>
</table>

& OR k BETWEEN 15000 AND 1500545848
```
Innotop in MySQL Shell

How to use it?
How to use this module in MySQL Shell?

The module is available on github: https://github.com/lefred/mysql-shell-innotop
How to use this module in MySQL Shell?

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How to use this module in MySQL Shell?

The module is available on github: https://github.com/lefred/mysql-shell-innotop

Add in ~/mysqlsh/mysqlshrc.py.
does it work everywhere?

**Limitations**
Limitations

- requires ncurses
Limitations

- requires ncurses
- works almost exclusively on Gnu/Linux
I want to contribute!

How to write your own extension?
Creating you own extension

All extensions are a single file located in the **modules** folder:
Skeleton of an extension

Every extension starts the same way and requires some mandatory modules:
Skeleton of an extension

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Every extension starts the same way and requires some mandatory modules:

Then you need to specify the shortcuts that calls the functions:
Skeleton of an extension

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Skeleton of an extension

Every extension starts the same way and requires some mandatory modules:

```
return: name of the module (dummy.py)
stdscr: use the same screen (and pass it to the function)
```
Skeleton of an extension - run()
Thank you!

Any Questions?

share your 💖 for MySQL on social media using