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**Innovation.doc**

The major innovation for this module is consolidation the entire project submission into a code friendly markup language driven document that is context sensitive to MySQL, mongoDB, JSON and python code syntax. The stylesheets behind the documenting system was customized to include JSON and MongoDB support and matching syntax color set in the style sheets behind the code using knowledge gained from the Web development module for this semester.

The document is generated in HTML, exported as PDF using stylesheets for export and converted into a word document for reference an portability. See the Two documents attached for the project.

**Python code related innovations.**

Some minor innovation were applied to the python code part of the project.

The ﬁrst part is in the men code barely noticeable except if the queries are slow to execute.

The message will be displayed “Running query, please wait ….” and on completion of the query the line will be erase and replace with a new message, for example “View 15 cities”. This is achieved by applying two parameters to the print statement.

print('**\r**running query, please wait ..... ',end='') result = mysql\_query(query)

print('**\r**View 15 Cities ')

This ocde above causes the ﬁrts message to be displayed as long as the query rungs and raplaces that with the second message when the query completes.

The second innovation in the python code is the printing of all the query results in Ascii tabular format similar to the native output formats for MySQL. This output format is applied for both MySQL as well as mongoDB tables.

[View](http://search.oracle.com/search/search?group=MySQL&amp;q=VIEW) 15 Cities

+----+----------------+-------------+---------------+------------+----------+-----------+

| ID | Name | CountryCode | District | Population | latitude | longitude |

+----+----------------+-------------+---------------+------------+----------+-----------+

+----+----------------+-------------+---------------+------------+----------+-----------+

Press [space](http://dev.mysql.com/doc/refman/%35%2E%31/en/string-functions.html) [to](http://search.oracle.com/search/search?group=MySQL&amp;q=TO) continue ...

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | 1 | | | Kabul | | | AFG | | | Kabol | | | 1780000 | | | None | | | None | | |
| | | 2 | | | Qandahar | | | AFG | | | Qandahar | | | 237500 | | | None | | | None | | |
| | | 3 | | | Herat | | | AFG | | | Herat | | | 186800 | | | None | | | None | | |
| | | 4 | | | Mazar-e-Sharif | | | AFG | | | Balkh | | | 127800 | | | None | | | None | | |
| | | 5 | | | Amsterdam | | | NLD | | | Noord-Holland | | | 731200 | | | None | | | None | | |
| | | 6 | | | Rotterdam | | | NLD | | | Zuid-Holland | | | 593321 | | | None | | | None | | |
| | | 7 | | | Haag | | | NLD | | | Zuid-Holland | | | 440900 | | | None | | | None | | |
| | | 8 | | | Utrecht | | | NLD | | | Utrecht | | | 234323 | | | None | | | None | | |
| | | 9 | | | Eindhoven | | | NLD | | | Noord-Brabant | | | 201843 | | | None | | | None | | |
| | | 10 | | | Tilburg | | | NLD | | | Noord-Brabant | | | 193238 | | | None | | | None | | |
| | | 11 | | | Groningen | | | NLD | | | Groningen | | | 172701 | | | None | | | None | | |
| | | 12 | | | Breda | | | NLD | | | Noord-Brabant | | | 160398 | | | None | | | None | | |
| | | 13 | | | Apeldoorn | | | NLD | | | Gelderland | | | 153491 | | | None | | | None | | |
| | | 14 | | | Nijmegen | | | NLD | | | Gelderland | | | 152463 | | | None | | | None | | |
| | | 15 | | | Enschede | | | NLD | | | Overijssel | | | 149544 | | | None | | | None | | |

Car by enginesize

+------+---------------+----------------+-------------------+

| \_id | car\_reg | car\_engineSize | addresses |

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| 1.0 | 191-G-123 | 1.5

| 2.0 | 11-LM-988 | 1.3

| 3.0 | 142-G-28 | 1.0

| 6.0 | 152-MO-134 | 1.5

| 5.0 | 05-D-1234 | 1.4

| 7 | 99-D-69674 | 1.0

| 9 | 09-WW-5475957 | 1.8

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Press [space](http://dev.mysql.com/doc/refman/%35%2E%31/en/string-functions.html) [to](http://search.oracle.com/search/search?group=MySQL&amp;q=TO) continue ...

Input data entere by users are optomised and checked where possible, caoatalised and for example when a car reg is entered in lower case without dashes they're capatailised and deshes added.

I also added function “c” to check for dependant modules required to run the code. So if any of the include libraries are not installed they will be highligthed as missing.

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