



# Fundamentals of Data Management

## Credit Tasks 10.2: Performance

### Overview

You'll learn how DBMSs execute queries, how to find out about database statistics, when to create indexes and how to investigate whether an index is being used.

### Purpose

Gain practical experience of some performance-related matters in databases.

### Task

Download the Ubuntu virtual machine from Canvas and open it in the VMWare Player. Follow the instructions to open two connections to the MySQL server from the MySQL Workbench. Work through the tasks below.

### Time

This task should be completed in your lab class and submitted for feedback in lab 10 or at the beginning of lab 11.

### Resources

- Online module (from Canvas)
- MySQL (on FDM virtual machine) and MySQL Workbench (or other RDBMS and suitable client).

### Feedback

Discuss your solutions with the tutorial instructor.

### Next

Get started on module 12.

## Credit Tasks 10.2 — Submission Details and Assessment Criteria

Document your solutions to the tasks using a word processor. Upload your solutions to Doubtfire, then discuss it with your tutor.

Use either window and run a simple query:

```
EXPLAIN EXTENDED SELECT * FROM Products;
```

You will receive a listing that includes the following columns:

Column	What the values mean
<b>ID</b>	ID field for the step
<b>select_type</b>	The type of query, such as SIMPLE (no joins) or UNION. See listing: <a href="https://dev.mysql.com/doc/refman/5.7/en/explain-output.html#explain_select_type">https://dev.mysql.com/doc/refman/5.7/en/explain-output.html#explain_select_type</a>
<b>table</b>	The table accessed to get the rows.
<b>type</b>	The type of join used. Most common options: <b>all</b> – This usually means that the table has been searched sequentially, which is expensive (making an index might help). <b>ref</b> – The DBMS uses an index on the key column to find the matching rows. Listing of all options: <a href="https://dev.mysql.com/doc/refman/5.7/en/explain-output.html#jointype_const">https://dev.mysql.com/doc/refman/5.7/en/explain-output.html#jointype_const</a>
<b>possible_keys</b>	The names of indexes that could be used. To find out which columns the indexes are made on, use SHOW indexes in <table_name>;
<b>key</b>	The index that was actually used for the search.
<b>key_len</b>	The length of the key that was used.
<b>ref</b>	Shows which columns or values were compared when the index mentioned under 'key' was used.
<b>rows</b>	Shows how many rows the DBMS believes it has to examine. This is an estimate based on statistics, not actual values.
<b>filtered</b>	The percentage of the table rows that will be examined based on the condition in the WHERE clause.
<b>Extra</b>	Any additional information.

## Subtask 10.2.4

Examine the Vendors table. Which columns have indexes?

SQL
<pre>EXPLAIN EXTENDED SELECT * FROM Vendors WHERE VendZipCode=98001;</pre>

Run the SQL query shown in the box, then run the query plan. Examine the output with the help of the column explanations given above.

Is the query executed the way you expected?

Document and upload your findings.