

Assignment-5

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Assignment 5: Demonstrate the creation of an index on a table and discuss how it improves query performance. Use a DROP INDEX statement to remove the index and analyze the impact on query execution.

Books Table:

```
mysql> select * from Books;
```

BookID	Title	ISBN	PublishedYear	Genre	AuthorID	CopiesAvailable
1	Book A	1234567890123	2010	Fiction	1	5
2	Book B	2234567890123	2020	Non-Fiction	2	2
3	Book C	3234567890123	2015	Fiction	1	3
4	Book D	4234567890123	2005	Science	3	10
5	Book E	5234567890123	2018	History	4	7

```
5 rows in set (0.00 sec)

mysql> |
```

Create an Index on the Genre Column:

```
mysql> CREATE INDEX idx_genre ON Books (Genre);
Query OK, 0 rows affected (0.05 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> |
```

Query Performance with the Index

```
mysql> EXPLAIN SELECT * FROM Books WHERE Genre = 'Fiction';
```

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	Books	NULL	ref	idx_genre	idx_genre	203	const	2	100.00	NULL

```
1 row in set, 1 warning (0.01 sec)

mysql> |
```

Remove the Index

```
mysql> DROP INDEX idx_genre ON Books;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> |
```

Query Performance Without the Index:

```
mysql> EXPLAIN SELECT * FROM Books WHERE Genre = 'Fiction';
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| id | select_type | table | partitions | type | possible_keys | key | key_len | ref | rows | filtered | Extra |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | SIMPLE | Books | NULL | ALL | NULL | NULL | NULL | NULL | 5 | 20.00 | Using where |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set, 1 warning (0.00 sec)
```

```
mysql> |
```

Analysis

With Index:

- Query scans fewer rows because the Genre column is indexed.
- Improves performance for queries with WHERE or JOIN conditions on the indexed column.

Without Index:

- Full table scan is required, which slows down queries as the table size grows.