

Лабораторын ажил – 4

SQL Indexing – тай ажиллах

Urguu.mn database – ын users table – д 25 сая өгөгдөл оруулах үйлдлийг procedure ашиглан хийж гүйцэтгэв.

```
9      DELIMITER //
10     CREATE PROCEDURE insert_random_data6 (
11         IN users VARCHAR(100),
12         IN num_rows INT
13     )
14     BEGIN
15         DECLARE i INT DEFAULT 1;
16         DECLARE size INT DEFAULT 25000000;
17         DECLARE string_length INT DEFAULT 8;
18         DECLARE rand_string VARCHAR(10) DEFAULT '';
19         DECLARE j INT DEFAULT 1;
20         WHILE i <= num_rows DO
21             SET string_length = FLOOR(RAND() * 20) + 1;
22             SET rand_string = '';
23             SET j = 1;
24             WHILE j <= string_length DO
25                 SET rand_string = CONCAT(rand_string, CHAR(FLOOR(RAND() * 94) + 33));
26                 SET j = j + 1;
27             END WHILE;
28             INSERT INTO users (id, username, email, phone_number, passwordd)
29                 VALUES (i, FLOOR(RAND() * 10), FLOOR(RAND() * 100), FLOOR(RAND() * 800), rand_string);
30             SET i = i + 1;
31             IF i % size = 0 THEN
32                 COMMIT;
33             END IF;
34         END WHILE;
35     END //
36     DELIMITER ;
```

Тухайн procedure – ийг ажилуулах функц

```
CALL insert_random_data6('users', 25000000);
```

Тухайн users хүснэгтийн phone_number болон email баганыг индексжүүлэх функц

```
CREATE INDEX one_column
ON users (phone_number, email);
```

SQLyog interface showing a query execution result:

```

1 SELECT username, email, phone_number, passwordd
2 FROM users
3 WHERE phone_number LIKE "1%" AND email LIKE "1%"
4
5 SELECT *
6 FROM users
7
8 CREATE INDEX one_column
9 ON users (phone_number);
10
11 SHOW INDEX
12 FROM users
13
14 DROP INDEX one_column
15 ON users
16
17

```

1 queries executed, 1 success, 0 errors, 0 warnings

Query: select * from users

25000000 row(s) affected

Execution Time : 0.058 sec
Transfer Time : 33.165 sec
Total Time : 33.223 sec

Index хийхийн өмнө Select statement ашигласан хугацаа: 24.872 sec

SQLyog Trial 64 - [New Connection/test - root@localhost*]

File Edit Favorites Database Table Others Tools Powertools Transactions Window Help

6 days trial left BUY

New Connection X New Connection X +

Filter Tables in test
Filter (Ctrl+Shift+B)

Search As Regex

- root@localhost
- information_schema
- mysql
- performance_schema
- phpmyadmin
- test

SQLyog interface showing a query execution result:

```

1 SELECT username, email, phone_number, passwordd
2 FROM users
3 WHERE phone_number LIKE "1%" AND email LIKE "1%"
4
5 CREATE INDEX one_column
6 ON users (phone_number);
7
8 SHOW INDEX
9 FROM users
10
11 DROP INDEX one_column
12 ON users
13
14

```

1 Result 2 Profiler 3 Messages 4 Table Data 5 Info

(Read Only)

username	email	phone_number	passwordd
94	190	116255	()RD-I3bvKEP4Q
94	14	189540	WNa m.:w1+SzI"/#5t12]]=V
12	109	144121	+=.m'm++6nGWbeI3aa6,v0
26	190	125570	FsdFo(>cUajmf:+tFFF=) %
98	18	106596	z0[\<0wmpNt 24ZxpHUIqVfzWMSbn#_612HP=
59	193	140232	GN4W:Z:0ax
88	172	167081	(Vz(P?'Gnv4TV3-cEDdM6cp+#1z@m1tqRFy1(
59	158	1311	MS:djFD"/kQ4Nm2
50	146	175564	,5jolo(wB\$,
93	188	101213	+DRP
144781	144781	144781	144781

select username, email, phone_number, passwordd from users where phone_number like "1%" and email like "1%"

Query batch completed successfully Total: 24.872 sec 1019368 row(s) Connections: 2 Get Support during evaluation!

Index хийсний дараа Select statement ашигласан хугацаа: 0.012 sec

The screenshot shows the SQLyog Trial 64 interface. The left sidebar displays the database structure for the 'test' database, including tables like 'indexing', 'information_schema', 'mysql', 'performance_schema', 'phpmyadmin', and 'test'. The main window shows a SQL query being executed:

```
1. SELECT username, email, phone_number, passwordd
2. FROM users
3. WHERE phone_number LIKE "1%" AND email LIKE "1%"
4.
5. CREATE INDEX one_column
6. ON users (phone_number);
7.
8. SHOW INDEX
9. FROM users
10.
11. DROP INDEX one_column
12. ON users
13.
14.
```

The query results are displayed in a table with columns: username, email, phone_number, and passwordd. The results show 24 rows of data. The status bar at the bottom indicates: "Query batch completed successfully", "Total: 0.012 sec", "1019368 row(s)", "Connections: 2", and a link to "Get Support during evaluation!".

username	email	phone_number	passwordd
94	198	116255	{RD>I3bvKF4Q
94	14	189540	WNa(m.:wi+9z "/f5ti2}}=V
12	109	144121	+..m'm++6nGWbeTSaa6,v0
126	190	125570	rsdFo(>cUajmf:+FFfP=)%
98	18	106596	z0[\<UwvpNt 24ZxpHUTGVIzWMM5bn#_612HF=
59	193	140232	GN4W:2;Oax
88	172	167081	(Vz(P?'GnvsTV3-cpEdDdM6cp+#1z8m1tc8REyl(
59	158	1311	MS:djFD"/kQ4NmZ
50	146	175564	,qjo10(wB6,
93	188	101213	+DRP
86	175	144751	h008+5-c0M3VC+2n6c1\517_1-hT

Дүгнэлт

Индексхийхийн өмнө select statement ашиглан phone_number нь 1-ээр эхэлсэн болон email нь 1-ээр эхэлсэн багануудын мэдээллийг харуулахад 24.872 секунд болсон бол индекс хийсний дараа 0.012 секунд болж буурсан. Үүнээс үзэхэд индекс нь хүснэгтээс хайлт хийх гүйцэтгэлийг 2072.66 дахин хурдан болгосон байна.