

Assignment 10

STEP 1: CREATE TABLES WITHOUT KEYS AND INDEXES.

```
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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

[mysql> use azp5611_431W;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
[mysql> CREATE TABLE azp5611_table1(fld1 VARCHAR(30) NOT NULL, fld2 VARCHAR(30) NOT NULL, fld3 VARCHAR(30) NOT NULL,
fld4 VARCHAR(30) NOT NULL);
Query OK, 0 rows affected (0.02 sec)

[mysql> describe azp5611_table1;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| fld1  | varchar(30)   | NO   |     | NULL    |       |
| fld2  | varchar(30)   | NO   |     | NULL    |       |
| fld3  | varchar(30)   | NO   |     | NULL    |       |
| fld4  | varchar(30)   | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql>
```

TABLE: azp5611_table1

```
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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

[mysql> use azp5611_431W;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
[mysql> CREATE TABLE azp5611_table2(fld1 VARCHAR(30) NOT NULL, fld2 VARCHAR(150) NOT NULL, fld3 VARCHAR(30) NOT NULL,
fld4 VARCHAR(30) NOT NULL);
Query OK, 0 rows affected (0.02 sec)

[mysql> describe azp5611_table2
-> ;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| fld1  | varchar(30)   | NO   |     | NULL    |       |
| fld2  | varchar(150)  | NO   |     | NULL    |       |
| fld3  | varchar(30)   | NO   |     | NULL    |       |
| fld4  | varchar(30)   | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)

mysql>
```

TABLE: azp5611_table2

```

mysql> CREATE TABLE azp5611_table3(fld1 VARCHAR(30) NOT NULL, fld2 VARCHAR(30) NOT NULL, fld3 VARCHAR(30) NOT NULL,
fld4 VARCHAR(30) NOT NULL);
Query OK, 0 rows affected (0.03 sec)

mysql> describe azp5611_table2;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| fld1  | varchar(30)   | NO   |     | NULL    |       |
| fld2  | varchar(150)  | NO   |     | NULL    |       |
| fld3  | varchar(30)   | NO   |     | NULL    |       |
| fld4  | varchar(30)   | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql>

```

TABLE: azp5611_table3

STEP 2: Load the data, perform a SELECT * FROM [table name] LIMIT 10 for each table.

```

~ — azp5611@CMPSC431W-S016: ~ — ssh -p 1855 azp5611@cmpsc431w-S016.vhost.psu.edu — 116x29
ERROR 1049 (42000): Unknown database 'azp5611_431w'
mysql> use azp5611_431w;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> LOAD DATA LOCAL INFILE '/home/azp5611/w10_table1.csv' INTO TABLE azp5611_table1 FIELDS TERMINATED BY',' LINES
TERMINATED BY '\r\n' (fld1,fld2,fld3,fld4);
Query OK, 9977 rows affected (0.16 sec)
Records: 9977 Deleted: 0 Skipped: 0 Warnings: 0

mysql> SELECT * FROM azp5611_table1 LIMIT 10;
+-----+-----+-----+-----+
| fld1 | fld2 | fld3 | fld4 |
+-----+-----+-----+-----+
| 1119 | 10540 | 27487 | 7405.75 |
| 6356 | 10368 | 21008 | 2214.71 |
| 5550 | 15133 | 22300 | 3740.96 |
| 2959 | 15181 | 20097 | 978.09 |
| 8115 | 16013 | 24002 | 4187.89 |
| 6496 | 10400 | 23572 | 2641.65 |
| 8911 | 10662 | 20552 | 7536.58 |
| 2291 | 15386 | 22949 | 9164.34 |
| 9887 | 17176 | 27481 | 9416.11 |
| 8988 | 12918 | 29747 | 7867.41 |
+-----+-----+-----+-----+
10 rows in set (0.00 sec)

mysql>

```

TABLE: azp5611_table1

```
~ -- azp5611@CMPSC431W-S016: ~ -- ssh -p 1855 azp5611@cmpsc431w-S016.vmhst.psu.edu -- 116x29
| 2291 | 15386 | 22949 | 9164.34 |
| 9887 | 17176 | 27481 | 9416.11 |
| 8988 | 12918 | 29747 | 7867.41 |
+-----+
10 rows in set (0.00 sec)

(mysql> LOAD DATA LOCAL INFILE '/home/azp5611/w10_table2.csv' INTO TABLE azp5611_table2 FIELDS TERMINATED BY ',' LINE
S TERMINATED BY '\r\n' (fld1,fld2,fld3,fld4);
Query OK, 19977 rows affected (0.29 sec)
Records: 19977 Deleted: 0 Skipped: 0 Warnings: 0

(mysql> SELECT * FROM azp5611_table2 LIMIT 30;
+-----+
| fld1 | fld2 | fld3 | fld4 |
+-----+
| 14368 | "6b146a8661b2f2bc4920330d373226face3611bba03d1482b7e037a48959b849" | 29362 | 28612.50 |
| 17512 | "640949fc4f03f143b5a437fa9ce8829a2ba9c0f0d50196f319e703f10f141c04" | 25649 | 61707.70 |
| 19902 | "f9657701a36bd3355db5993d89681e7c09166fe39e0815fac57afe7e6a28c605" | 20204 | 29070.80 |
| 14864 | "ceca50684ebbb3be136861a1a7b10bdac5903018bac1bead30ac6b939e54a84" | 22287 | 77774.78 |
| 14626 | "cfbee755a4758f51cb647ad731901c14ae1af0ea4953fd47b01f19659a89a7c" | 27000 | 47968.54 |
| 15741 | "39bf7922db1c657d000fae88efc7a62d742607ddc6e4e2730774dc6319edf2d1" | 26837 | 84108.94 |
| 19676 | "52396135d427dca207114b3247faad64d32e66eb25e424668d180250c5a63e6c" | 28926 | 83022.21 |
| 17787 | "80f9f4b867369af033415676b96c666b8fb0aa48a1b7f12278685119d61a221b" | 25343 | 68115.42 |
| 10740 | "af80c85fa7404c1fd039c907ff563486b4e1c47902787a07790586f81bc82711" | 20004 | 86564.33 |
| 19339 | "c2c3c3ec078f6fdb222dba676e413b6488f5a0c472f6dca499e78fecff471a94" | 26698 | 14803.38 |
+-----+
10 rows in set (0.00 sec)

mysql>
```

TABLE: azp5611_table2

```
~ -- azp5611@CMPSC431W-S016: ~ -- ssh -p 1855 azp5611@cmpsc431w-S016.vmhst.psu.edu -- 116x29
| 17787 | "80f9f4b867369af033415676b96c665b8fb0aa48a1b7f12278685119d61a221b" | 25343 | 68115.42 |
| 10740 | "af80c85fa7404c1fd039c907ff563486b4e1c47902787a07790586f81bc82711" | 20004 | 86564.33 |
| 19339 | "c2c3c3ec078f6fdb222dba676e413b6488f5a0c472f6dca499e78fecff471a94" | 26698 | 14803.38 |
+-----+
10 rows in set (0.00 sec)

(mysql> LOAD DATA LOCAL INFILE '/home/azp5611/w10_table3.csv' INTO TABLE azp5611_table3 FIELDS TERMINATED BY ',' LINE
S TERMINATED BY '\r\n' (fld1,fld2,fld3,fld4);
Query OK, 29977 rows affected (0.28 sec)
Records: 29977 Deleted: 0 Skipped: 0 Warnings: 0

(mysql> SELECT * FROM azp5611_table3 LIMIT 10;
+-----+
| fld1 | fld2 | fld3 | fld4 |
+-----+
| 28098 | 13563 | 5062 | 5383 |
| 27105 | 19240 | 3628 | 6697 |
| 22276 | 11385 | 2819 | 1355 |
| 23908 | 16912 | 3408 | 8790 |
| 24394 | 11037 | 5214 | 1649 |
| 28804 | 16418 | 0407 | 6101 |
| 25484 | 19107 | 4293 | 8618 |
| 22057 | 17046 | 6174 | 9000 |
| 28233 | 18147 | 0070 | 1434 |
| 28569 | 18319 | 9294 | 5376 |
+-----+
10 rows in set (0.00 sec)

mysql>
```

TABLE: azp5611_table3

STEP 3: Execute a COUNT(*) on each table.

```
mysql> use azp5611_431w;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> SELECT COUNT(*) FROM azp5611_table1;
+-----+
| COUNT(*) |
+-----+
|      9977 |
+-----+
1 row in set (0.01 sec)

mysql> SELECT COUNT(*) from azp5611_table2;
+-----+
| COUNT(*) |
+-----+
|     19977 |
+-----+
1 row in set (0.01 sec)

mysql> SELECT COUNT(*) from azp5611_table3;
+-----+
| COUNT(*) |
+-----+
|     29977 |
+-----+
1 row in set (0.01 sec)

mysql>
```

STEP 4: Execute the following query, results including the number of rows and the time it took to execute the query.

SELECT * FROM azp5611_table1 T1, azp5611_table2 T2, azp5611_table3 T3 WHERE T1.fld2 = T3.fld1 AND T1.fld3 = T2.fld1 AND T1.fld3 = T3.fld1 AND T2.fld1 = T3.fld2;

```
mysql> SELECT * FROM azp5611_table1 T1, azp5611_table2 T2, azp5611_table3 T3 WHERE T1.fld2 = T3.fld1 AND T1.fld3 = T2.fld1 AND T1.fld3 = T3.fld1 AND T2.fld1 = T3.fld2;
```

fld1	fld2	fld3	fld4	fld1	fld2	fld3	fld4	fld1	fld2	fld3	fld4
7324	18133	25664	4489.74	18133	"3b5b559d37e3bc85edf6ccca7d6864c4e02f3086a3dc10ac3d498a1679f4b2985"	25498	23344.79	25664	18133	7539	2934
6735	17488	22507	1869.38	17488	"d0ff9a3828d461d03f2a556f12d625d1c81472a98a95275e1d846295eb69487"	29270	51227.40	22507	17488	5371	6882
525	11329	25167	8890.49	11329	"28ae87bed2da5eb3f8dfb12840f8d911ddcccd66dba84e511424e81cd7c1898e1"	24915	88383.36	25167	11329	6238	7182
8993	19374	23598	5863.85	19374	"0fb9f35aa03efec2f2c778b5829c147967531bb5d9ad16373b781fa8112beb563"	26769	16319.79	23598	19374	5891	6364
525	11329	25167	8890.49	11329	"3c1cccdcb1e9838bc28bd3be767bbec53f17d959c89cd35f9ccffbb4c50953b1"	24178	93016.13	25167	11329	6238	7182
8993	19374	23598	5863.85	19374	"ca7ccaa0945ae74b474d341ba323668b1d0a1846a8af5af3c979825d47fc5699"	27767	18867.85	23598	19374	5891	6364
6882	17252	25894	7781.39	17252	"5f50d50bcb4da5235435de8f47cae3d6f395b9d05e8814c5d76d824ffc841391"	20670	58810.31	25894	17252	4188	6461
4650	13650	24517	5943.21	13650	"076c9b230699ab99526cae73bbffcd18c74fc50d7838b44dbd1589578641ab03"	29219	39501.88	24517	13650	7944	3074
8993	19374	23598	5863.85	19374	"8fdac76933367899a3ca7a3b4719663ddca88c8e688c447a896f87854e797cd3a"	28134	58552.53	23598	19374	5891	6364
608	13645	24126	201.60	13645	"b31141f13863017c0fd736a98ae8cd3fd7815f781a22cdf4a8f9012a4e8dc87bc"	26189	17852.37	24126	13645	3544	8178
5965	16309	29884	2005.04	16309	"9d5afdd5cf45cae67524e0f27fedba7bf76618cf54aaa3d7f8f64d4120d0b30b"	25781	78605.59	29884	16309	2145	0995
608	13645	24126	201.60	13645	"d4d49d87e2fddc80d73ae2665ca33161b04e674017e4cna752795cae6a7803251"	27798	11628.37	24126	13645	3544	8178
7340	12861	20284	4484.87	12861	"e8f0f2391a0af70e04a3cc25141c8d91201a03b6775bc971f12e7c171174ffea"	23478	68360.16	20284	12861	9174	3721
7731	15474	24453	4030.26	15474	"ada85d7f5f9dd08d325d355d88414a199fc8e2568fabb136fc34ec158dc91509"	20054	24381.79	24453	15474	2953	1370
7731	15474	24453	4030.26	15474	"238cd0070c07cd8c358c4724f11b3496c7ba3e52fcdc1ab59acba8aa5e515b83"	26331	73504.24	24463	15474	2953	1370
525	11329	25167	8890.49	11329	"966c72c326c587703a835dde28a96002b7ba53e253ae19ecc59817e95abb9d24"	24230	81871.58	25167	11329	6238	7182
4650	13650	24517	5943.21	13650	"41918c436a390872a85b9147ad5dd31028144cb7a928ed94bb3dcdc55c250dc5"	22817	51390.60	24517	13650	7944	3074
7731	15474	24453	4030.26	15474	"546f2eed67bb7ae300b6ee0bda7e9136c4556086ffecb78340ed0885163525a37"	28181	25961.21	24463	15474	2953	1370
6735	17488	22507	1869.38	17488	"34180352de77f45bd571c615a1620b4057b693c30898f9f9c18b159d297d1a0"	23076	47140.82	22507	17488	5371	6882
525	11329	25167	8890.49	11329	"e1be9c7d6626407cedfa855befbcbf27f468c843ae8fb7f53ad8c834f8c107c3"	22815	44755.98	25167	11329	6238	7182

```

-- azp5611@CMPSC431W-S016: ~ -- ssh -p 1855 azp5611@cmpsc431w-S016.vmlhost.psu.edu -- 158x47
2753 | 12632 | 20789 | 3740.95 | 12632 | "ebb005eafb90e274690e33f1fa92d0829df773c3a47c31e43b8df42a5d158e9b" | 21336 | 51582.63 | 20789 | 12632 | 8722 | 4886
2753 | 12632 | 20789 | 3740.95 | 12632 | "ea36e589be15f30195a649d479ba3bc2d4b7051e7cfffccf0a3d80e21a7e5433a" | 23741 | 752.05 | 20789 | 12632 | 8722 | 4886
9984 | 16429 | 24414 | 9661.21 | 16429 | "72f9aa5cfd5ec57b91d267b344a630c528f17514969f510b79cd2cac9991099" | 28749 | 66741.63 | 24414 | 16429 | 5762 | 6905
688 | 13645 | 24126 | 201.60 | 13645 | "2784cc811165938c000b72d0aa7b7e143c19796ba17c13c4467caa0772c7de8" | 26660 | 32770.59 | 24126 | 13645 | 3544 | 0178
9984 | 16429 | 24414 | 9661.21 | 16429 | "e7f8633db4ba94760e1a76b2dd7e9f2be619269b12d872e6418baed70d1e48fb" | 24464 | 91938.17 | 24414 | 16429 | 5762 | 6905
7423 | 10215 | 24656 | 2373.39 | 10215 | "abbf0cfa0a534ae15e22f6449805c3447166a7d9a0f19282c89336474ae35c" | 22593 | 27542.99 | 24656 | 10215 | 0984 | 7765
7340 | 12861 | 20204 | 4484.87 | 12861 | "b0832beb24d6930233652f60f378bb344d3aa49486354d918dd1c237a555fd01" | 22826 | 86511.91 | 20204 | 12861 | 9174 | 3721
2753 | 12632 | 20789 | 3740.95 | 12632 | "c0fa2b44b64361ab63419fbc309d28accdc0c46bc5ed9ef0ba6ae3807df7fea1" | 27596 | 4111.94 | 20789 | 12632 | 8722 | 4886
7731 | 15474 | 24453 | 4030.26 | 15474 | "1d3605dd92a524ab3baada9ca0498924f1167ec28d4f429aaf667ba6e63b6510" | 23436 | 1502.98 | 24453 | 15474 | 2953 | 1370
6889 | 17252 | 25094 | 7701.39 | 17252 | "f9cb066ee072f6979c642816015fc547488d9397bc58cd961d4b740c8c1d68bc" | 23031 | 38200.50 | 25094 | 17252 | 4108 | 6461
9984 | 16429 | 24414 | 9661.21 | 16429 | "2a8154556d73d718cde7f6f915a3bbb1fc2804490833830a987ce2b68cc0333" | 23007 | 7644.72 | 24414 | 16429 | 5762 | 6905
7423 | 10215 | 24656 | 2373.39 | 10215 | "f331a36c994a55e7d66e295c962fc2f711e6a2949e25fcbaf1a30955c90a334" | 27973 | 64594.38 | 24656 | 10215 | 0984 | 7765
7731 | 15474 | 24453 | 4030.26 | 15474 | "157d5b6693dc22a6f9d85b563d15f97633d7e476a77a97fd06bacd3f686aa1c23" | 28510 | 28820.31 | 24453 | 15474 | 2953 | 1370
4650 | 13650 | 24517 | 8943.21 | 13650 | "a51960a8b6c6c6c4ec8ecd8bbbae15058fd6bf62d7917976631b9e505756a02de9" | 21166 | 54776.79 | 24517 | 13650 | 7944 | 3074
7731 | 15474 | 24453 | 4030.26 | 15474 | "eb8d2d4a36be2aa271d677cf50cd08937c30af3c14c2b3816d1286da3fd2ec33" | 20938 | 900.12 | 24453 | 15474 | 2953 | 1370
5573 | 11265 | 24277 | 1473.56 | 11265 | "1bfab6d37aeba2a04cd78f736ca0f004300420c567786bf5132b1c5aa3f4748" | 20780 | 30703.32 | 24277 | 11265 | 5191 | 2401
525 | 11329 | 25167 | 8890.49 | 11329 | "7393d0e99d6fce0afbfac00805e68dc7671c83d2fb0291ce1e7f480bdd0691eb" | 21230 | 95230.79 | 25167 | 11329 | 6238 | 7102
8993 | 19374 | 23598 | 5863.05 | 19374 | "081f01b3ae99920c38009c814f3d8fca354d72a12c561d75d36f85c51691e56e" | 28553 | 47105.92 | 23598 | 19374 | 5891 | 6354
8993 | 19374 | 23598 | 5863.05 | 19374 | "3cf44f345cde061862737f3fac1980d714b7547acb85140cc92b22f9bdc0e5bc" | 20049 | 54264.43 | 23598 | 19374 | 5891 | 6354
5573 | 11265 | 24277 | 1473.56 | 11265 | "1ba9f5957d7f9c5ecf17f85a6dcffdc31882f2c374de111fdefc3c58fc7aabf" | 29717 | 46664.62 | 24277 | 11265 | 5191 | 2401
525 | 11329 | 25167 | 8890.49 | 11329 | "90b47469f09042c051f53c9121aecf5f2a8cc17661c2384ae3577e4e9b8d5e84" | 23420 | 5077.20 | 25167 | 11329 | 6238 | 7102
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
61 rows in set (23.00 sec)

mysql>

```

STEP 5: Execute an EXPLAIN command on the previous SELECT statement.

```

mysql> EXPLAIN;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '' a
t line 1
mysql> EXPLAIN SELECT * FROM azp5611_table1 T1, azp5611_table2 T2, azp5611_table3 T3 WHERE T1.fld2 = T2.fld1 AND T1.fld3 = T3.fld1 AND T2.fld1 = T3.fld2;
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| id | select_type | table | partitions | type | possible_keys | key | key_len | ref | rows | filtered | Extra |
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | SIMPLE | T1 | NULL | ALL | NULL | NULL | NULL | NULL | 9896 | 100.00 | NULL |
| 1 | SIMPLE | T3 | NULL | ALL | NULL | NULL | NULL | NULL | 29555 | 1.00 | Using where; Using join buffer (Block Nested Loop) |
| 1 | SIMPLE | T2 | NULL | ALL | NULL | NULL | NULL | NULL | 19966 | 10.00 | Using where; Using join buffer (Block Nested Loop) |
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set, 1 warning (0.00 sec)

mysql>

```


STEP 6: Analyze the results of the EXPLAIN. Modify the database as needed to get the results to display in less than one second. Demonstrate this by re-executing the previous SELECT statement. Execute another EXPLAIN on the query and explain what it says and how it is different from the first EXPLAIN.

-> Explain is used to obtain a query execution plan, which is the information from the optimizer about the statement execution.

-> In our first execution of the SELECT statement, there is no indexing or keys being defined in our tables, therefore execution takes 27 seconds using WHERE clause with joins.

-> After, modifying the tables by creating indexes in order to speed up searches/queries, results described below;

```
mysql> CREATE UNIQUE INDEX fields_index on azp5611_table1(fld1,fld2,fld3,fld4);
```

```
mysql> CREATE UNIQUE INDEX field2_index on azp5611_table2(fld1,fld2,fld3,fld4);
```

CREATE UNIQUE INDEX field3_index on azp5611_table3(fld1,fld2,fld3,fld4);

-> Now, PERFORM SELECT * statement again in order to compare the execution time of the previous SELECT statement with the current SELECT statement.

```
Database changed
mysql> SELECT * FROM azp5611_table1 T1, azp5611_table2 T2, azp5611_table3 T3 WHERE T1.fld2= T2.fld1 AND T1.fld3 = T3.fld1 AND T2.fld1 = T3.fld2;
```

fld1	fld2	fld3	fld4	fld1	fld2	fld3	fld4	fld1	fld2	fld3	fld4
1012	17922	26772	6098.60	17922	"fld260fbfb017e8973886aef45218d2bbab5032162954c82d40128a73c1e3f0"	22085	25558.94	26772	17922	8469	2911
2753	12632	20789	3740.95	12632	"57b8b9b444ee8d5719f8894f7c38405bb201197b9b44c2179d875315b822648e"	25226	18973.25	20789	12632	8722	4886
2753	12632	20789	3740.95	12632	"9acfb6a6b5e2472f86eeac6d8942c7807f07bdc19adb23fe0a4d2506376251d35"	26032	92165.88	20789	12632	8722	4886
2753	12632	20789	3740.95	12632	"c8fa2b44b64361ab63419fbc309d28aacdc0c46b0c5ed9ef0bea3887df7fea1"	27596	4111.94	20789	12632	8722	4886
2753	12632	20789	3740.95	12632	"ea36e689be16f30195a649d479ba3bc2d4b7061e7cfffccf8a3d88e21a7e5433a"	23741	752.05	20789	12632	8722	4886
2753	12632	20789	3740.95	12632	"ebb005eafb90e274690e33f1fe92d0829df773c3a47c31e43b0df42a5d158e9b"	21336	51582.63	20789	12632	8722	4886
4650	13658	24517	5943.21	13658	"076c09b230609ab09626cae73bbffcd18c74fc50d7038b64dhd15005786a1ab83"	20219	35581.88	24517	13658	7944	3074
4650	13658	24517	5943.21	13658	"41918c436a390872a85b9147ad5dd31828144cb7a928ed94bb3ddcd55c200dc6"	22817	51390.60	24517	13658	7944	3074
4650	13658	24517	5943.21	13658	"a51960e85cc6c4ec8ecd5bbbaae15058fd6bf42d7917976531b9e880756a02da9"	21166	54775.79	24517	13658	7944	3074
525	11329	25167	8890.49	11329	"11d494cc5fb6685ededada09d393bcaa8e075957e149ab279f7b15b3960f1baf"	28462	90245.59	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"16179a49886ac3757d6e79e26beaa42d85043aee3ab85199119bbdbc8feb8d79"	23716	35855.15	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"28ae87bed2da6eb3f0dfb1284ef0d911ddcdcd66d8a4e51142ae81cd7c1898e1"	26915	80303.36	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"3c1cccdcb1e9388bc20bd3be767bbec53f17d959c89c35f9ccfbb4c50953b1"	24178	93016.13	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"5114d6d76ca886786f77bdf15ffdc8cbbaae4e3c8fa92f3dd35e4fdffd935ae"	27002	72100.95	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"7393d0e99d6fcae0afbfac06085e68dc7671c83d2fb0291cae1e7f480bdc0691eb"	21230	95230.79	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"966c72c326c587703a835dde28a94002b7ba53a253aa1aacc59817a95abb9d24"	26280	81071.58	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"98b47f49f09042c051f53c9121aee0f5f2a8cc17561c2384ee3577e4e9b8d8e84"	23428	5077.20	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"e1be9c7d66264007cedfa858bfbfcf727f468c843ae8fb7f53ed8c834f8c107c93"	22810	44755.38	25167	11329	6238	7102
525	11329	25167	8890.49	11329	"f1efcc0cc1047706a247cf082a80e779972739810edfbfd91e1a4f6001512969"	20626	11207.39	25167	11329	6238	7102
5073	11265	24277	1473.56	11265	"1b9f05957d7f9c5ecf17f85e6dcffdc31882f2c374de1117dfefc3c58fc7aebf"	29717	46604.82	24277	11265	5191	2401

```

-- azp5611@cmpsc431w-s010:~$ ssh -p 1600 azp5611@cmpsc431w-s010.mysqlcloud -- 16047

```

7731	15474	24453	4030.26	15474	"ada86d7f5f9ddd88d325d355d08414e199fc8e2568fab136fc34ec155dc91509"	20654	24381.79	24453	15474	2953	1370
7731	15474	24453	4030.26	15474	"d172a41b78336fbb913e13f585d0e59246d08be1088a3426005956820afa7075"	29728	61042.68	24453	15474	2953	1370
7731	15474	24453	4030.26	15474	"eb8d2d4a36be2aa271d677cf50cd08937c30af3c14c2b3816d128da3fd2ec33"	20938	900.12	24453	15474	2953	1370
7731	15474	24453	4030.26	15474	"f7b2f5225acd141792bc535df9bef936699a33c8931af3acba2a13b95007bdd"	28036	54984.89	24453	15474	2953	1370
7731	15474	24453	4030.26	15474	"fb86564d2ea8ed0eb1eaf1a244e02872dc3f85ec716de615e7173580b7e0e42"	21611	8850.04	24453	15474	2953	1370
8993	19374	23598	5863.05	19374	"0fb9f35aa03efec2f2c770b5829c147957531bb5d9ad16373b781fa8112beb53"	26769	16319.79	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"3cf46f345cde061062737f3fac1980d714b7647acb86140cc92b22f9bdc8e5bc"	28069	54264.43	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"501f01b3ae99920c38d09c814f3d8fca354d72a12c561d75d36f85c51691e56a"	28583	47105.92	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"762a6c00b923082f2bacb9a41c1f86fd34ba2f76bacf291136c86964a10a7a80"	23485	21324.38	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"8309462f448cb048729e4932f9929f66c4939ce2309275d5d8146e4e5699d25"	21888	42598.76	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"8fdef67933367899a3ca7a3b471963d6a88c5a68c447a896f07854e707cd3a"	25134	58552.63	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"a47e19bdef5cbdefbca347f6181c6a02dad76475da6bffa539543491633c81"	29712	10336.14	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"ca7ccaa0945ee74b474d341ba323668b1d0a1846a8af5ef3c979825d47fc6699"	27767	18867.85	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"e57927f4f7187968a9217857666629706df4a32ef58224b5bb5ecf5fee6fcec"	27887	77219.22	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"f619a798f790934ccc7585377badd4ee6faca169281420d7b2ca6c1ec5e7e779"	21833	30506.81	23598	19374	5891	6354
8993	19374	23598	5863.05	19374	"f96ef925a6b82d93c7f56ca258ac8212053bca26f32cb3218e56bdc344d0646"	25142	91815.67	23598	19374	5891	6354
9984	16429	24414	9661.21	16429	"09890de7b6d11a73038fffdcf0822352d86b34545e18f5525fc8378039ef7b16"	28329	68530.18	24414	16429	5762	6905
9984	16429	24414	9661.21	16429	"2a8164666d73d718cda7fa6f91ba3bb1f62884490833830a987ce2b66cc8333"	23887	7644.72	24414	16429	5762	6905
9984	16429	24414	9661.21	16429	"72f9aa5cfd5ec57b91d267b364a630c520f17514969f510b79cd2cac9991099"	28749	66741.63	24414	16429	5762	6905
9984	16429	24414	9661.21	16429	"9e41b426c854b5fd1b16f87a149a8d2b8d9727a38f609172447b268aa2a70d33"	27979	63862.62	24414	16429	5762	6905
9984	16429	24414	9661.21	16429	"e7f8633db4ba947460e1a76b2dd7e9f72be619269b1d2872e6418aad70d1e48fb"	24464	91938.17	24414	16429	5762	6905

```

--
81 rows in set (0.02 sec)

```

-> The execution takes 0.02 seconds by defining UNIQUE INDEX for columns in tables to retrieve data more quickly.

-> EXPLAIN statement shows the difference and number of rows that were involved in execution.

-> Here, "type" shows the column that is compared to the index named in the key column. Besides, "rows" lists the number of records that were examined to produce this output.

```

mysql> EXPLAIN SELECT * FROM azp5611_table1 T1, azp5611_table2 T2, azp5611_table3 T3 WHERE T1.fld2= T2.fld1 AND T1.fld3 = T3.fld1 AND T2.fld1 = T3.fld2;

```

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	T1	NULL	index	NULL	fields_index	128	NULL	9977	100.00	Using index
1	SIMPLE	T3	NULL	ref	field3_index	field3_index	64	azp5611_431W.T1.fld3,azp5611_431W.T1.fld2	1	100.00	Using index
1	SIMPLE	T2	NULL	ref	field2_index	field2_index	32	azp5611_431W.T1.fld2	3	100.00	Using index

```

--
3 rows in set, 1 warning (0.00 sec)

mysql>

```