Practical 1

- a) Import Database, understand Query execution plan using SQL Yog b) Analyze impact of index , type of index on query performance
- a) Database Structure
 - Database: MySQL
 - Total data rows in table ds_leaderboard: 4,00,000
 - PC Configuration
 : Intel® Core™ i3-4130 CPU @ 3.40GHz × 4
 : ~ 4 GB RAM

Table: ds_leaderboard

Table:ds_programminglanguage

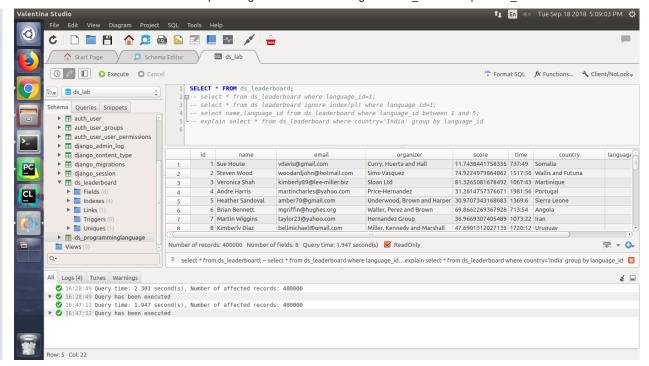
```
CREATE TABLE `ds_programminglanguage` (
        id` Int( 11 ) AUTO_INCREMENT NOT NULL,
        name` VarChar( 32 ) CHARACTER SET utf8 COLLATE utf8_general_ci NOT NULL,
        version` VarChar( 16 ) CHARACTER SET utf8 COLLATE utf8_general_ci NULL,
        release` Date NULL, PRIMARY KEY ( `id` )
)
CHARACTER SET = utf8
COLLATE = utf8_general_ci
ENGINE = InnoDB
AUTO_INCREMENT = 13;
```

b) Impact of index

Case 1

```
select * from ds_leaderboard;
```

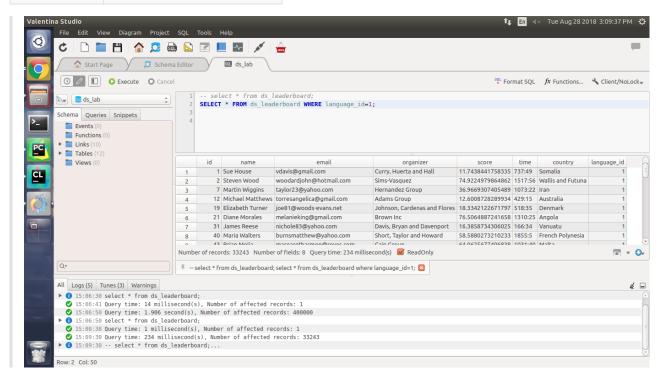
Query time	1.947 s
Index used	No index to be used because we are loading all data of all attribute(column)



Case 2.1: with index

select * from ds_leaderboard where language_id=1;

Query time	234 ms
No. of records	33243
Index used	index on attribute language_id



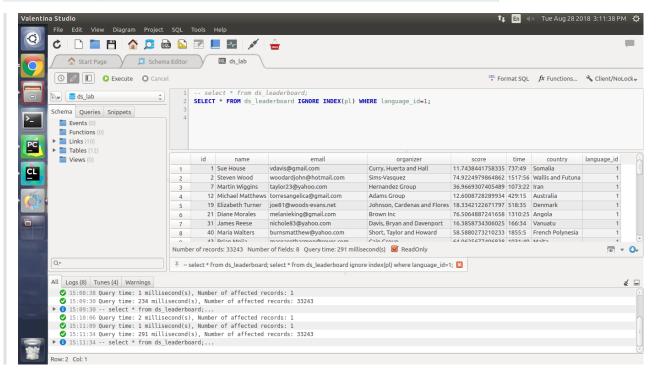
Case 2.2: without index (forced to not to use)

select * from ds_leaderboard ignore index(pl) where language_id=1;

Query time	291 ms
No. of records	33243

Query time 291 ms

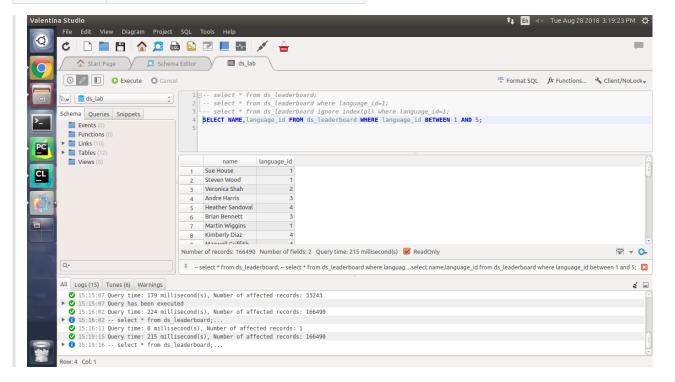
Index used (No index) ignoring index on attribute language_id (index referred as p1)



Case 3.1: with no index

select name,language_id from ds_leaderboard where language_id between 1 and 5;

Query time215 msNo. of records166490Index used(No index used) (possible key on language_id)



Case 3.2: with index on language_id (force to use)

select name,language_id from ds_leaderboard use index(pl) where language_id between 1 and 5;

Query time	206 ms
No. of records	166490
Index used	forced to use index on language_id (pl)

Case 4.1: using index on country



Query time	20 ms
No. of records	1597
Index used	used index on country

Case 4.2: without index (forced to ignore)

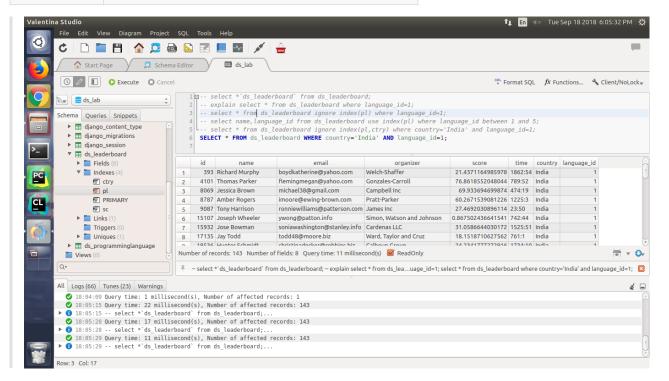
```
select * from ds_leaderboard ignore index(ctry) where country='India';
```

Query time	155 ms
No. of records	1597
Index used	forced to ignore index on country

Case 5.1: using index on language_id and country

```
select * from ds_leaderboard where country='India' and language_id=1;
```

Query time	11 ms
No. of records	143
Index used	Using intersect(pl,ctry); index of language_id and country



Case 5.2: force to ignore index on country

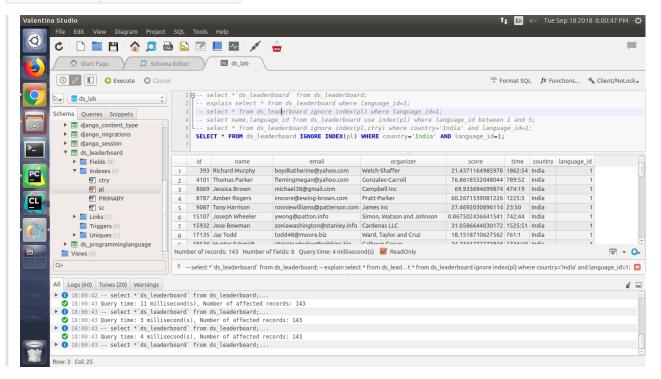
select * from ds_leaderboard ignore index(ctry) where country='India' and language_id=1;

Query time	42 ms
No. of records	143
Index used	Using index on language_id

Case 5.3: force to ignore index on language_id

select * from ds_leaderboard ignore index(pl) where country='India' and language_id=1;

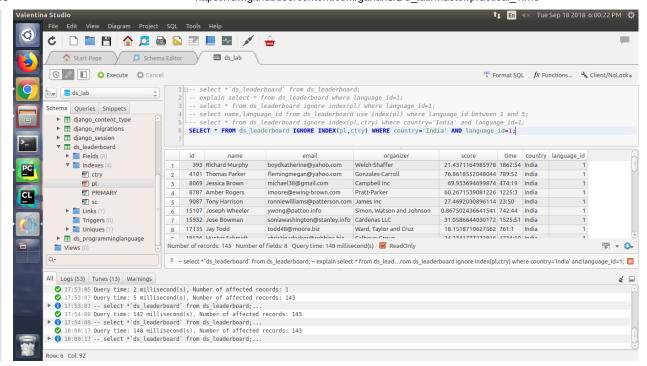
Query time	4 ms
No. of records	143
Index used	Using index on country



Case 5.4 without index

select * from ds_leaderboard ignore index(pl,ctry) where country='India' and language_id=1;

Query time	148 ms
No. of records	143
Index used	No index used; Forced to ignore index



Summary

In records of 4,00,000 entries 33,243 entries having *language_id* equals to 1 (As in Case 2) and just 1597 entries having *country* equals to India (As in Case 4) and only 143 entries having both (As in Case 5).

In case 5.1 query engine choose to use index of both attribute language_id (pl) and country (ctry) and intersection of it is displayed which took about 11 ms whereas when we forced to use only index on *country* the result took only 4 ms but for only using index on *language_id* it costs 148 ms