Final Report: SQL Features

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Overview

- 75% work done
  - ✓ Issue 551
  - ✓ Issue 552
- 100% work done
  - ✓ Issue 562
  - ✓ Issue 543
  - ✓ Issue 401
  - Issue 561
- 125% work done
  - ✓ Issue 515
- Benchmark & testing
- Pull Request URL:
  - https://github.com/cmu-db/peloton/pull/669
75%: WORK DONE
✓ Issue 551: support NULL insertion
Be able to insert a tuple with NULL values into table.

Before 1st code review
- Support simple_optimizer

After 1st code review
- Support new_optimizer
- Support codegen (llvm)
75%: WORK DONE
✓ Issue 551: support NULL insertion
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75%: WORK DONE

✓ Issue #552: Support "is null" and "is not null" in where clause

Be able to evaluate whether a value is (not) NULL is where clause

<table>
<thead>
<tr>
<th>Before 1st code review</th>
<th>After 1st code review</th>
</tr>
</thead>
<tbody>
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After 1st code review
- Support new_optimizer
- Support codegen (llvm)
100%: WORK DONE
✓ Issue#562: GROUP BY is broken

After 1st code review

- Support new_optimizer
- With bug: VARCHAR anomaly
100%: WORK DONE
✓ Issue#543: Cannot use exprs inside of aggregate functions

After 1st code review

- Support new_optimizer
- SELECT SUM(a+b) from table;
100%: WORK DONE
✓ Issue#401: Inconsistent results with basic1.sql

Inconsistent results in Jenkins and in local.

After 1st code review

- PASS on command-line

```bash
git:(master) Xbash ../script/testing/psql/psql_test.sh
Exception Type :: Catalog
Message :: Table foo is not found
***PASS***
100%: WORK DONE
Issue#561: Support IN in where clause

Support Array_type for postgresparser in Expr_Transform

After 1st code review

- Done: the codes in src/parser & src/type
- Not done: the codes in src/codegen -> need a translator
125%: WORK DONE
Issue#515: Add TRUNCATE SQL command

After 1st code review

- Run using Postgresparser and new_optimizer
125%: WORK DONE

Issue#515: TRUNCATE

```
postgres=# create table a(id int, value int);
create table a(id int, value int) 0
postgres=# insert into a values(1, 2);
insert into a values(1, 2) 1
postgres=# select * from a;
id | value
-----+-----
 1 |  2
(1 row)

postgres=# truncate table a;
truncate table a 1
postgres=# select * from a;
id | value
-----+-----
(0 rows)
```
BENCHMARK AND TESTING

Before 1st code review

- Wrote 4 unit test for new features in `test/sql/new_feature_test.cpp`
- All tests passed.

After 1st code review

- Wrote 3 unit test for new features in `test/type/array_type_test.cpp`, `test/sql/truncate_test.cpp`, `test/sql/aggregation_sql_test.cpp`, `test/sql/group_by_sql_test.cpp`
- All tests pass under new_optimizer
More on WHERE IN and TRUNCATE

We implemented where in using ARRAY type and wrote test cases to test the constant value expression evaluate method with ARRAY type, and comparison expression with tuples the array. Test cases all passed, however, running where in command will encounter seg fault. We spent days to figure out the seg fault reason. Since the unit test for the internal implementation of where in passed, we think the seg fault may from the steps after the parser tree, like optimizer or other part of the process.

For truncate, the current implementation assume truncate is equivalent to “delete from table”, and no not implement exception. And later when we trying to do truncate we realize we need to deallocate the tiles. But we didn’t understand the how the tile group is managed, so we found out it’s difficult to do it.