

Introduction to Database System - Assignment 3 Report

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Phase 2 Report

1. Implementation Differences

- Parse
 - Lexer
 - Parser
 - QueryData
- Algebra
 - Plan
 - ExplainPlan
 - ExplainScan
 - TablePlan, ProductPlan, SelectPlan, SortPlan, GroupByPlan, ProjectPlan, MergeJoinPlan, MaterializePlan
- Planner
 - BasicQueryPlanner

2. Implementation Details

Plan

- Instead of overriding the built-in `toString` function, we introduced a virtual function called `outputString` in the `Plan` interface. To capture the required information for `EXPLAIN`, we will implement the `outputString` function in the derived classes of `Plan`. Both two methods yield the same result and there is no difference between the performances.

ExplainPlan

- In our implementation, we initialize the output schema in the constructor of `ExplainPlan`, while in the solution, an individual schema will be initialized and returned when `schema()` is called. However, these two methods do the same effect.
- We return the number of outputs recorded in the histogram when calling `recordsOutput()`. Nevertheless, since we only print the output of `EXPLAIN` once, the return value of `recordsOutput()` should be 1. A constant 1 should be returned directly as in the solution.

ExplainScan

- Our implementations of `beforeFirst()` and `next()` are similar to the solution. Since we want to print exactly one record in `ExplainScan`, we return the class attribute `isBeforeFirst` which is a `boolean` value when `beforeFirst()` is called and check this value in `next()`.
- In `getVal()`, we use `String.contentEquals()` instead of `String.equals()` used in the solution. In general, we have more freedom in the implementation of the former one than in the latter. While `String.equals()` can only compare `String` objects, `String.contentEquals()` can compare `String`, `StringBuilder`, `StringBuffer`, and so on. However, this makes no difference in this case since the given parameter is `String`.

Other Plans

- We also implemented `EXPLAIN` in both `MergeJoinPlan` and `MaterializePlan`. Since there are no keywords for `JOIN`, we haven't done any experiments on the output. Also, the materialized method is not tested here.

Reference:

 [Source Code](#)